

NUTRITION ASSESSMENT

AFMADOW & HAGAR DISTRICTS LOWER JUBA REGION SOMALIA.

Food Security Analysis Unit (FSAU/FAO)
United Nations Children's Fund (UNICEF)
World Food Programme (WFP)
World Concern

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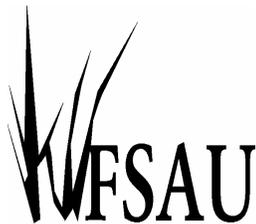


TABLE OF CONTENTS

	Page No.
TABLE OF CONTENTS.....	2
ACKNOWLEDGEMENTS.....	4
EXECUTIVE SUMMARY.....	5
SUMMARY OF FINDINGS.....	7
1 INTRODUCTION.....	8
2 BACKGROUND INFORMATION.....	10
3 METHODOLOGY.....	12
4 THE ASSESSMENT RESULTS.....	17
5 DISCUSSION AND CONCLUSIONS.....	32
6 RECOMMENDATIONS.....	34
7 APPENDICES.....	35
8 ASSESSMENT TEAM.....	50
9 REFERENCES.....	50

Abbreviations and acronyms

ARI	Acute Respiratory Infections
CSI	Coping Strategy Index
FAO	Food and Agriculture Organisation
FSAU	Food Security Analysis Unit
GAM	Global Acute Malnutrition
GIT	Gastrointestinal Tract
HAZ	Height- for- Age Z scores
HDDS	Household Dietary Diversity Score
HAZ	Height for Age Z scores
IDA	Iron Deficiency Anaemia
IDP	Internally Displaced Person
KM	Kilo Metres
MCH	Maternal and Child Health
MT	Metric Tonnes
MUAC	Mid Upper Arm Circumference
NCHS	National Centre for Health Statistics
NGOs	Non-Governmental Organisations
NRC	Norwegian Refugee Council
PWA	Post War Average
LEZ	Livelihood Economic Zones
LNGO	Local Non-Governmental Organisation
INGO	International Non-Governmental Organisation
NIDs	National Immunisation Days
OR	Odds Ratio
RR	Relative Risk
SACB	Somalia Aid Coordination Body
SMART	Standardised Monitoring & Assessment of Relief and Transitions
TOT	Terms of Trade
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations High Commission of Refugees
VAD	Vitamin A Deficiency
UNICEF	United Nations Children's Fund
WAZ	Weight for Age Z Scores
WFP	World Food Programme
WHO	World Health Organisation
WHZ	Weight for Height Z scores

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This assessment was undertaken through the collaborative efforts of FSAU, WFP, UNICEF, World Concern and AFREC. FSAU provided three assessment coordinators and three supervisors, led in the training of the assessment team, coordinated data collection, entry and analysis and produced the report. WFP participated in the assessment team training, provided one supervisor, provided technical input to the assessment tools, contributed to the draft report and contributed in transport expenses and venue for data entry. UNICEF funded assessment vehicles and provided anthropometric equipment. World Concern funded personnel related costs including enumerators, supervisors, field guides and data entry clerks. AFREC provided background information of the assessment areas.

The data could not have been obtained without the cooperation and support of the communities assessed, especially the mothers and caregivers who took time off their busy schedules to respond to the interviewers. Their involvement is highly appreciated.

FSAU, WFP and UNICEF also express their sincere appreciation to the entire assessment team for the high level of commitment, diligence, and ingenuity demonstrated during all stages of the assessment.

EXECUTIVE SUMMARY

Afmadow/Hagar district is located in Lower Juba region in southwest Somalia. The district has an estimated population size of about 77,027 (WHO 2005, NID figures verified by the assessment team) distributed into three main livelihood zones: 45% agropastoral; 50% pastoral and 5% urban. The region is one of the most affected by the drought-induced humanitarian crisis that has recently affected Southern Somalia. Afmadow/Hagar has a loose administrative structure in operation and has experienced several security incidents in past few months.

Between 2nd and 9th May 2006 an interagency nutrition and mortality assessment was conducted by FSAU, WFP, UNICEF, World Concern and AFREC in Afmadow/ Hagar District. Using a two-stage (30x30) cluster sampling methodology, a total of 903 children, aged 6-59 months and/or measuring 65-109.9 cm in height/length were assessed. A total of 899 households were assessed for mortality and child data collected from a total 455 households with a mean household size of 6.4 (SD= 2.6) persons.

Most (89.7%) of the assessed households were residents. Majority of the households had either pastoral (40.4%) or agro-pastoral (39.3%) livelihoods. Sale of animal products (41.8%) and casual labour (32.3%) were the two main income sources to most households. Most (75.8%) of the assessed households drew water from unprotected water sources like water catchments (61.3%) and shallow wells (14.5%). Sanitation was generally poor among the assessed households with majority of the households (66.4%) having no access to sanitation facilities.

The global acute malnutrition (GAM) rate (weight for height <-2 Z score or oedema) was 22.0% (CI: 19.4 – 24.9) while the severe acute malnutrition (weight for height <-3 Z score or oedema) was 4.2% (CI: 3.0 – 5.8) indicating a critical nutrition situation according to WHO classification. Six cases of oedema were recorded. Malnutrition showed significant associations with morbidity and was higher among those who had been ill ($p=0.008$) and between diarrhoea ($p=0.00007$) and ARI incidences ($p=0.007$).

The crude and underfive mortality rates were 0.77 (CI: 0.46 – 1.08) and 1.57 (CI: 0.85 – 2.29) deaths/10,000/day respectively. These rates indicate acceptable levels according to WHO classification. Diarrhoeal diseases, ARI and birth related complications were the main reported causes of under-five deaths while ARI and anaemia were the main causes of death among adults and children over five years.

Overall, about 70% of the assessed children had suffered from one or more communicable childhood diseases during the two weeks prior the assessment. A widespread measles outbreak experienced in the previous 2-3 months in the region and wider Somalia accounted for the high measles incidences (13.8%). ARI (38.8%), diarrhea (34.7%) and febrile illness (suspected malaria) incidences were also high. Slightly more than one-quarter (26.4%) had consumed 3 or fewer food groups reflecting a poor dietary diversity. Most (89.5%) children are introduced to complementary foods much earlier in life before the age of four months. Immunization coverage in the district was generally high following recent campaigns by humanitarian agencies. About 88% and 84% of the assessed children had been immunized against measles and polio respectively. The on-going humanitarian food assistance by the WFP/AFREC may also have mitigated the nutrition situation.

Compared to the long term levels of malnutrition for the district, the results indicate deterioration in nutrition situation. The nutrition and food security situation has worsened and requires continued intervention and close monitoring. There is need to immediately rehabilitate the many marasmic and oedematous children and improve access to diversified diet to the households until the community recovers from the impact of the drought.

Following discussions held after sharing the results with partners and detailed data analysis, both short- and long-term recommendations were made:

Short term recommendations:

1. The observation of many oedema and marasmus cases in Afmadow and Hagar districts calls for an establishment of a management system (health facility-based) for severe malnutrition cases within the district.
2. As food security continues to deteriorate, interventions that improve household access to food are indicated for the next 2-4 months.
3. Continuation and intensification of health, water and sanitation interventions especially immunization programs, rehabilitation and protection of water points and provision of sanitary facilities. Measles immunization should be accompanied with Vitamin A supplementation in future immunization campaigns.

Long-term Recommendations

1. It is highly recommended that the local MCHs / local health personnel are equipped with the knowledge and skills to manage severe malnutrition (especially community-based) both during and outside periods of crisis.
2. Improve access to quality for medical/health care through establishment of health clinics or outreach programme in Afmadow and Hagar.
3. Health/nutrition education for the population focussing especially on appropriate child feeding practices and management of diarrhoeal diseases.
4. The situation in the Afmadow, Hagar and the neighbouring districts would require close surveillance of the nutrition and morbidity to prompt appropriate intervention for any adverse changes.

SUMMARY OF FINDINGS

Indicator	No	%	95% CI
Total number of households assessed	455	100	
Mean household size	6.4 (SD=2.6)		
Mean number of children less than five years per household	2.0 (SD=0.9)		
Total number of children assessed	903	100	
Child Sex:			
Males (boys)	474	52.5	49.2 – 55.8
Female (girls)	429	47.5	44.2 – 50.8
Global Acute Malnutrition (WHZ<-2 or oedema)	199	22.0	19.4 – 24.9
Severe Acute Malnutrition (WHZ<-3 or oedema)	38	4.2	3.0 – 5.8
Oedema	6	0.7	0.3 -1.5
Global Acute Malnutrition (WHM<80% or oedema)	138	15.3	13.0 – 17.8
Severe Acute Malnutrition (WHM<70% or oedema)	17	1.9	1.1 - 3.1
Proportion of malnourished non pregnant women (MUAC≤18.5; N=311).	11	3.5	1.9 - 6.4
Proportion of severely malnourished non pregnant women (MUAC≤16.0)	4	1.3	0.4 - 3.5
Proportion of malnourished pregnant women (MUAC≤23.0; N=126)	63	50.0	41.0 – 59.0
Proportion of severely malnourished pregnant women (MUAC≤20.7)	23	18.3	11.9 – 26.1
Proportion of children with diarrhoea in 2 weeks prior to assessment	313	34.7	31.6 – 37.9
Proportion of children with ARI within two weeks prior to assessment	350	38.8	35.6 – 42.0
Children with suspected malaria in 2 weeks prior to assessment	177	19.6	17.1 – 22.4
Suspected measles within one month prior to assessment (N=862)	119	13.8	11.6 – 16.3
Children (9-59 months) immunised against measles (N=862)	755	87.5	75.0 – 89.6
Children who have ever received polio vaccine (N=903)	758	83.9	81.3 – 86.2
Children who received vitamin A supplementation in last 6 months or before (N=903)	290	32.1	29.1 – 35.3
Proportion of households who consumed ≤3 food groups	120	26.4	22.4 – 30.7
Proportion of households who consumed ≥4 food groups	335	73.6	69.3 – 77.6
Proportion of children 6-24 months who are breastfeeding (N=427)	165	38.6	34.0 – 43.5
Proportion of children introduced to other foods before 4 months	382	89.5	86.1 – 92.1
Under five Death Rate (U5DR) as deaths/10,000/ day		1.57	0.85 – 2.29
Crude Death Rate (CDR) as deaths/10,000/ day		0.77	0.46 – 1.08

1.0 INTRODUCTION

1.1 Overview

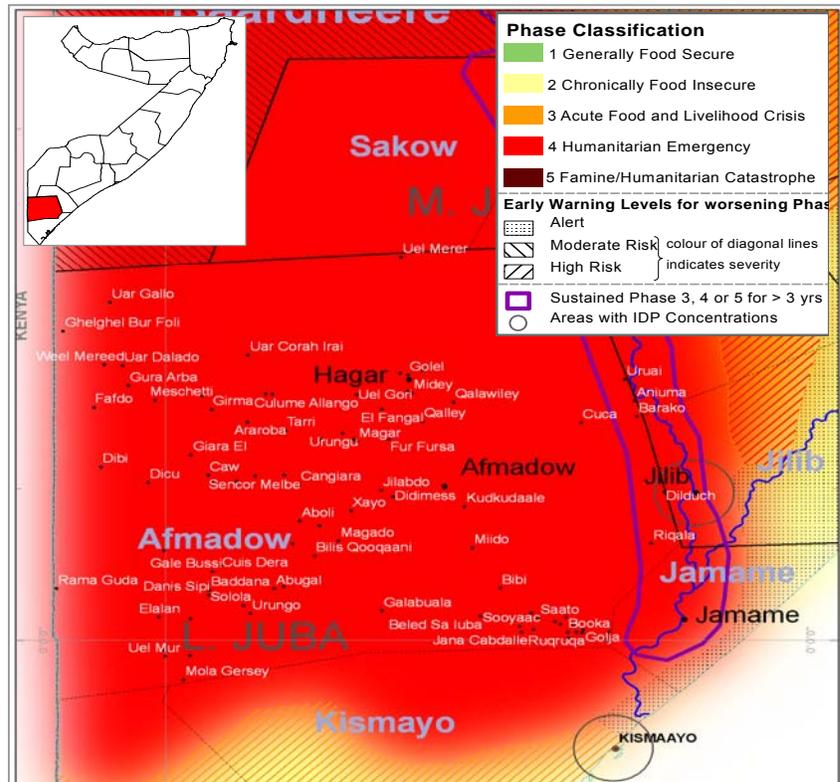
Afmadow and Hagar are two of the five districts covering the biggest part of Lower Juba region in southwest Somalia. The other three districts in the region are Badhadhe and Kismayo to the south; and Jamame to the southeast. Afmadow and Hagar are located along the Somalia-Kenya border of Wajir and Garissa districts to the West; Bardera and Sakow districts to the North (Fig 1).

Both districts have an estimated population size of about 77,027 (WHO 2005, NID figures verified by the assessment team) distributed into three main livelihood zones: 45% agropastoral; 50% pastoral and 5% urban. The region is one of the most affected by the drought-induced humanitarian crisis that has recently affected Southern Somalia.

The population size for the whole Lower Juba region as estimated during the 2005 polio immunisation campaign was 255,980. Population movement into and out of the region is strongly influenced by water, food security factors and civil insecurity. Afmadow

and Hagar have loose administrative structure in operation and have experienced several security incidents in past few months. Hagar was formally declared an autonomous district, hived from the larger Afmadow in 1989 just before the collapse of the Somalia government.

During the drought of the previous 3-5 months, many animals moved into the area from the neighbouring Kismayo district, from Gedo region and from as far as the Kenyan border of Garissa district in search of pasture. Pastoralists preferred moving their animals to the Afmadow and Hagar areas to the greener riverine areas of Jilib because of high tsetse fly infestation. The long drought spell caused animal deaths and reduced production of milk and other animal products.



1.2 Justification for the nutrition assessment

The persistent food insecurity in the district has deteriorated significantly due to the previous failure of both the Gu and Deyr/2005 rains. Consequently, pastures were depleted and water access was generally inadequate. According to the Integrated FSAU phase classification, a larger part of Afmadow/ Hagar district (about 69% of Afmadow/Hagar population) is classified to be in humanitarian crisis with 46% classified to be in the humanitarian emergency phase and 23% in acute livelihood crisis (FSAU technical Series, Report No. IV.8, 22 February, 2006). Information on the magnitude of malnutrition levels in Afmadow has been scarce and no standardised assessment has been conducted in this remote area due to insecurity. Although long-term estimates of the levels of malnutrition have been available, international organisations operating in the area especially WFP who are planning to assess its food distribution operations, needed more accurate estimations of the malnutrition rates.

1.3 Objectives of the study

1. To estimate the level of acute malnutrition and nutritional oedema among children aged 6-59 months or with height/length of 65-109.9 cm.
2. To estimate the level of malnutrition among adult women aged 15-49 years in Afmadow/ Hagar District.
3. To identify factors likely to have influenced malnutrition in young children in the district
4. To estimate the prevalence of some communicable childhood diseases (measles, diarrhoea, malaria, and ARI) in the districts.
5. To estimate measles and polio vaccination and vitamin A supplementation coverage among children in Afmadow/ Hagar District
6. To estimate the crude and under-five mortality rates in Afmadow and Hagar districts.

2.0 BACKGROUND INFORMATION:

2.1 General organization and administration

Afmadow/ Hagar are two districts integrated and based in the same livelihood zones. The community mainly depend on livestock and livestock product sales. Many others are agropastoralists depending on agricultural-products. The soils are fertile and well covered with grass and because of that, it has the largest proportion of cattle population of Somalia. Afmadow community had neglected farm cultivation due to poor farm input and knowledge and due to availability of cheaper cereals from the riverine that discouraged the farmers from growing their own crops. This has reduced crop production rate to the lowest ever recorded comparing to post war average (PWA.).

Hagar community practices more farming than Afmadow even though it receives less rain, negatively affecting its crop production potential. The households therefore derive most income from sale of agropsatorial products. However, currently their main food source is purchase. There is minimal quantity of own production of agro-pastoral products mainly from cattle and maize. About 40-50% of cattle had died during the drought due to poor grazing, long distance to travel and drought related diseases.

Juba regions have drawn humanitarian attention in recent months due to the steadily worsening food security situation that has resulted in much animal movement and continues to threaten the livelihood of over 300,000 people in the region.

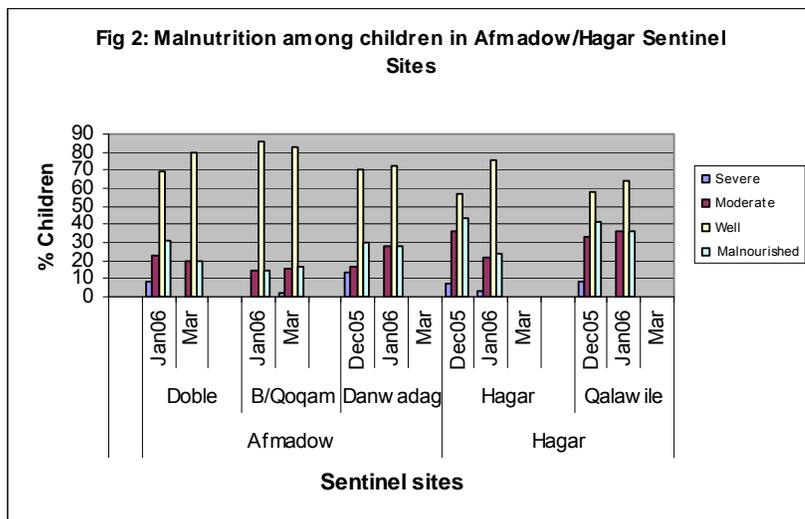
The clan-based organization is very important to consider because it determines the system of rules and regulations of the area. All the problems encountered by the population are solved according to the clan rules and regulations. Afmadow and Hagar have some loose administrative structures/committees in operation and this has led to many local leaders sometimes with competing interests taking advantage of the situation. The area has experienced several security incidents in past few months, which has hindered access by humanitarian agencies.

2.2 Humanitarian Interventions

WFP supports food distribution programmes in Afmadow/ Hagar. World Concern in partnership with AFREC is planning water & sanitation projects in the district while VSF-Swiss supports livestock healthcare.

2.3 Nutrition

A nutrition assessment has not been conducted in Afmadow before but FSAU Integrated Nutrition



Analysis of long term-trends estimates that the malnutrition level in Afmadow/ Hagar is in the range of 10 – 14.9%. However, in the past 3-4 months, high levels of malnutrition have been recorded in the district. Data from sentinel sites established by FSAU in Afmadow and Hagar from December 2005 through March 2006 show a mixed trend and high proportion (>20%) of malnourished children in the sites (Fig 2).

High morbidity, food insecurity and low dietary diversity have largely contributed to the poor nutrition condition in the district.

2.4 Water and Environmental Sanitation

The main source of water for Afmadow and Hagar districts is the catchments in the villages and (open, non- protected) hand-dug wells with poor sanitation which predisposes the community to diarrhoeal diseases in the area especially children under five years of age. World Concern/ AFREC have plans to implement water and sanitation program in the district with the objective of improving access of safe drinking water to the most vulnerable population and to provide them with knowledge and skills for preventing waterborne diseases. Although there has been good water availability in the district owing to the high water table in normal times, the previous drought condition led to drying up of most water points and/or lowering of the water levels in the wells.

2.5 Health issues

The international organizations UNICEF and WHO are involved in immunization campaigns, the last of such rounds undertaken in March 2006 following a widespread outbreak of measles in Somalia. Health services are inadequate in Afmadow/Hagar with no properly functioning health facilities and so most inhabitants get assistance from private pharmacies. Other health related services are sought from traditional healers or own medication. The common diseases reported from the sentinel sites include diarrhoea, ARI and malaria.

2.6 Food security

Food insecurity in the district increased from drought following the failure of *Gu* and *Deyr* 2005 rains. The crop in most areas never reached maturity while pasture and water scarcity affected the whole district. According to the FSAU 2005/06 Post *Deyr* analysis, Lower Juba region has experienced extremely poor crop production, poor conditions of livestock and decreased production and condition of livestock (FSAU technical Series, Report No. IV.8, 22 February, 2006). The least affected were the camels while cattle, sheep and goats were more affected by the drought. Livestock movement in search of pasture and water increased into the region. Due to lack of quality pasture, livestock milk production declined and price of milk, when available, is high.

3. METHODOLOGY

3.1 Assessment design

The study was cross-sectional in design and was undertaken among the Afmadow/ Hagar population in which both qualitative and quantitative techniques were used. Quantitative data was collected through a standard household questionnaire for nutrition (see appendix 2). Retrospective mortality data for 90 days prior to the assessment was also collected among the study households using a mortality questionnaire (see appendix 3). Qualitative data was collected by assessment supervisors and coordinators through focus group discussions and key informant interviews to provide further understanding of possible factors influencing malnutrition.

3.2 Sampling procedure

Using a two-stage cluster sampling methodology, 30 clusters were randomly selected based on population proportion to size. Initially a sampling frame was constructed from which a representative sample could be drawn. A list of all villages within the district, with their respective populations was used to construct cumulative population figures for the assessment area. Using WHO Polio population figures, generated during National Immunization Days (WHO, Nov 2005) and the input of key informants from the district, all settlements/villages were listed in the sampling frame and their population estimates further verified for authenticity by the assessment team. An estimated population of 77,027 from all settlements/villages was obtained from which 30 clusters were selected. Using the Nutrisurvey software a random number, 1332 was chosen to determine the first cluster. The subsequent clusters were determined systematically by adding the cluster interval (2567) to the first randomly selected number (see appendix 1). From the 30 randomly selected clusters, a total of 903 children (914 less 11 flags) aged 6-59 months and/or height/length of 65-109.9 cm from 455 households were assessed.

In each of the clusters, mortality questionnaires were administered to 30 randomly selected households. The same sampling frame used for nutrition assessment was employed in cluster selection for the mortality assessment. In total, mortality data was collected from 899 households irrespective of whether or not the household had a child under-five.

Study population and sampling criteria

The study population consisted of people living in Afmadow/ Hagar district and comprised all the children aged 6-59 months or measuring 65-109.9 cm for height/length. Sampling procedure as outlined in the SACB Guidelines (which now incorporates most issues in the SMART guidelines) was followed in this assessment. On the visit to each cluster, the centre was identified and a pen was spun to determine the direction to follow in moving to the edge of the cluster. On reaching the edge of a cluster, a pen was spun a second round, until the pen pointed inward the cluster/village to determine the direction to follow in the systematic selection of the households with children aged 6 to 59 months. The households in this direction were counted / established as the team crossed to the other edge and given numbers. A random number within the total number of households encountered was drawn to enable random selection of the first household to be visited. From the first household, the team always moved in right direction to the next household. This procedure was followed until the required 30 children were obtained in a cluster.

All sampled households were visited, the supervisor noting whether it was empty and whether children in the target age group were present or not. In households without children in the target age group, only mortality questionnaires were administered. If a cluster was exhausted of children before the required 30 children had been reached, a neighbouring village with similar characteristics was selected to complete the cluster. All eligible children in the households were measured and if a child or primary caregiver was absent, an appointment was booked for a later visit in the course of the assessment.

3.3 Data collection

3.3.1 Anthropometric measurements

The anthropometric data were collected using the procedure stipulated by the WHO (1995) for taking anthropometric measurements. Adherence to this procedure was ensured. The protocol used was as follows:

Weight: Salter Scale with calibrations of 100g-unit was used. This was adjusted before weighing every child by setting it to zero. The female children would be lightly dressed before having the weight taken while clothes for the male children were removed. Two readings were taken for each child, shouted loudly and the average recorded on the questionnaire.

Height: For height, a vertical or horizontal measuring board reading a maximum of 175cm and accurate to 0.1cm was used to take the height or length of a child. The child would stand on the measuring board barefooted; have hands hanging loosely with feet parallel to the body, and heels, buttocks, shoulders and back of the head touching the board. The head would be held comfortably erect with the lower border of the orbit of the eye being in the same horizontal plane as the external canal of the ear. The headpiece of the measuring board was then pushed gently, crushing the hair and making contact with the top of the head. Height/length was then read to the nearest 0.1cm. Two readings were recorded and the computed average used in the analysis.

Length: For children aged 6 to 24 months or between 65cm to 84.5cm length instead of height was taken. The child was made to lie flat on the length board. The sliding piece was placed at the edge of the bare feet as the head (with crushing of the hair) touched the other end of the measuring device. Then two readings were taken and the average computed.

Arm Circumference: The Mid Upper Arm Circumference was measured using a MUAC tape to the nearest 0.1 cm. Two readings were taken and the average recorded for each child.

3.3.2 Child age determination

Where useful documents like growth monitoring/clinic attendance cards and birth certificates were available, they were used to determine the child's age. Calendars of events (appendix 4) were also used as proxies to age determination. Though not entirely accurate, ages were still regarded as important indicators and were approximate/average pointers for identification. The nutrition indicator employed as preference was *weight for height* as the best nutrition status (acute malnutrition) for emergency and transitory populations.

3.3.3 Oedema

Oedema, defined as bilateral oedema on the lower limbs was assessed by gently pressing the feet to check if a depression is left after at least three seconds of pressing and was confirmed if present by the supervisor and then recorded.

3.3.4 Morbidity

Morbidity pattern was assessed by asking about incidences of common communicable diseases i.e. diarrhoea, acute respiratory infection, febrile illness/malaria and measles in the two weeks prior to the assessment.

Diarrhoea: Diarrhoea was defined as 'three or more loose or watery stools per day'.

Measles: Defined as 'more than three signs of the following :fever, and skin rash, runny nose or red eyes, and/or mouth infection, or chest infection.

Acute Respiratory Infection (ARI): Asked as *oof wareen or wareento*. Defined as 'cough, rapid breathing and fever'.

Suspected malaria/acute febrile illness: Defined as 'periodic chills, fever, sweating or coma.

3.3.5 Mortality

The mortality assessment was done concurrently with nutrition assessment in which a 30 by 30 cluster sampling methodology was used. The assessment methodology used for the nutrition assessment was adopted with the exception that households were selected as the second sampling unit. At least 30 households were randomly selected in each cluster and the mortality questionnaire administered to a responsible member of that household. All households within the selected cluster were eligible for inclusion in the mortality assessment, whether there was a child under the age of five or not. Households were systematically assessed until the 30th household. Each household assessed was asked the composition of their members in two parts- those members less than 5 years and the total number of household members. The household was then asked how many if any of the household members had died, left or arrived in the last three months (appendix 3). A total of 899 households were included in the assessment.

The crude and unadjusted mortality rates were generated automatically by the Nutrisurvey software as deaths per 10,000 persons per day using a recall period of 90 days. If a member had died, the respondent was asked to describe the signs and symptoms of the illness likely to have caused the death.

Mortality rates can be interpreted according to the following reference

- For under-five years old children
 - Under-five mortality rates ≥ 2 deaths/10,000/day indicate a situation of alert
 - Under five mortality rate ≥ 4 deaths/10,000 children/day indicate an emergency
- For the total population
 - Mortality rates ≥ 1 deaths/10,000 persons/day indicate an alert situation
 - Mortality rates ≥ 2 deaths/10,000 persons/day indicate an emergency.

3.3.6 Dietary Diversity

Dietary diversity (as households consuming four or more food groups) was determined by taking a simple count of various food groups consumed in a given household over the past twenty four hours. A total of 12 FAO recommended food groups were considered which included Cereals & cereal products; Roots & tubers; Vegetables; Fruits; Meat and meat products, Eggs; Fish; Legumes; Milk & its products; Fats & oil; Sugar & honey and Miscellaneous.

3.3.7 Vitamin A Deficiency

During the assessment, Vitamin A deficiency (VAD) prevalence was estimated by assessing if any member(s) of the households experienced difficulty seeing at night (sign of night blindness).

3.4 Description of assessment activities

Table 2: Chronology of activities for the Afmadow/ Hagar Nutrition Assessment

Major Activity	Dates. 2006
Preparation of tools, methodology & review of secondary data (Nairobi)	10 th – 19 th Apr
Resource mobilization; Joint planning meetings with partners	1 st – 30 th Apr
Training of enumerators and pre-testing	2 nd – 4 th May
Cluster Identification	4 th May
Collection of data	5 th – 9 th May
Entry of data in Afmadow/ Hagar	6 th – 15 th May
Preliminary analysis in Nairobi	15 th – 17 th May
Presentation of preliminary results to partners	17 th May
Further data cleaning and analysis	18 th – 22 nd May
Report writing	23 rd – 31 st May
Circulation of draft report	10 th June
Circulation of final report	27 th June

Six teams each consisting of two enumerators and one supervisor conducted the assessment with each team handling one cluster in a day. An elder from each village/cluster assisted the teams in identification of the cluster, its centre and boundaries. Supervisors were seconded from the participating partners namely; FSAU, UNICEF, World Concern and AFREC. Overall support, supervision and co-ordination were done by three FSAU Senior Nutritionists and one WFP coordinator who also assisted in the identification of the qualified enumerators selected on the basis of their literacy, need for participation in future nutrition activities and ability to learn nutrition assessment procedures during training.

3.5 Quality control procedures

A comprehensive training of enumerators and supervisors was conducted covering interview techniques, sampling procedure, inclusion and exclusion criteria, sources and reduction of errors, taking of measurements, standardisation of questions in the questionnaire, levels of precision required in measurements, diagnosis of oedema and measles, verification of deaths within households, handling of equipment, and the general courtesy during the assessment.

Standardisation of measurement and pre-testing of the questionnaire and equipment was carried out in one village in the outskirts of Afmadow town, which was not a selected cluster for the actual assessment. Pre-testing involved familiarising assessment teams with village/cluster entry; administering the questionnaire, sampling procedure, correct taking of measurements and recording. After the field exercise, views were exchanged to address the difficulties identified; appropriateness of the questions reviewed and necessary changes made.

Quality of data was also ensured through (i) monitoring of fieldwork by coordination team led by the FSAU assessment coordinators, (ii) crosschecking of filled questionnaires on daily basis and recording of observations and confirmation of measles, severe malnutrition and death cases by supervisors. All households sampled were visited and recorded including empty ones (iii) daily review undertaken with the teams to address any difficulties encountered, (iv) progress evaluation was carried out according to the time schedule and progress reports shared with partners on regular basis, (v) continuous data cleaning upon and after entry which made it easy to detect any outliers/ mistakes and to replace or repeat households depending on magnitude of error (vi) monitoring accuracy of equipment (weighing scales) by regularly measuring objects of known weights and (vii) continuous reinforcement of good practices. All measurements were loudly shouted by both the enumerators reading and recording them to reduce errors during recording.

3.6 Data Processing & Analysis

3.6.1 Data entry, cleaning, processing and analysis

Data was entered and analysed using Nutrisurvey, SPSS and EPI6 computer based packages. Running and tabulating all variable frequencies was carried out as part of data cleaning. The Nutrisurvey Anthropometry and EPINUT programmes were used to convert the measurements (weight and height) into nutritional indicators and comparison made with the National Centre for Health Statistics (NCHS) references as designed by WHO (1983). Analysis of certain variables was undertaken in Microsoft Excel.

3.6.2 General characteristics of assessment population

Frequencies and cross-tabulations were used to give percentages, confidence intervals, means and standard deviations in the descriptive analysis and presentation of general household and child characteristics.

3.6.3 Creation of nutritional status indices

The anthropometric measurement of weight and height were used to compute the WFH nutritional status indicators of the studied children. Weight For Height (WFH) expressed the weight of the child as a percentage of the expected weight for the standard child of that height as given by NCHS. WFH measures acute malnutrition or wasting. Using EPINUT, Z-scores were generated and the anthropometric indicator, WFH, was used to classify children into categories of nutritional status as follows:

< -3 Z-Scores or oedema	= Severe acute malnutrition
-3 Z-Scores \leq WFH < -2 Z-Scores	= Moderate acute malnutrition
< -2 Z-score or oedema	= Global/total acute malnutrition
\geq -2Z-Scores	= Normal

Similarly, MUAC measurements were also used to classify children into categories of nutritional status and mortality risks as follows according SACB Nutrition assessment guidelines:

< 11.0 cm	= Severe malnutrition
\geq 11.0 < 12.5	= Moderate malnutrition
\geq 12.5 < 13.5	= At risk of Malnutrition
\geq 13.5	= Normal

For adults, the following categories were used:

a) For non pregnant women:

< 16.0 cm and/ or oedema	= Severe Acute malnutrition
< 18.5 cm	= Global acute Malnutrition
\geq 18.5 cm	= Normal

b) For pregnant women:

\leq 20.7 cm	= At severe risk
\leq 23.0 cm	= Total at risk
> 23.0 cm	= Normal

4 ASSESSMENT RESULTS

4.1 Household Characteristics of Study Population

The nutrition assessment covered a total of 455 households with a mean household size of 6.4 (SD= 2.6) persons. The mean number of the under fives per household was 2.0 (SD=0.9).

Table 3: Household Characteristics

	N	% (CI)
Household size (Mean):	6.4 (SD=2.6)	
Mean No of Underfives	2.0 (SD=0.9)	
Household residence status (N=455)		
Residents	408	89.7 (86.4 – 92.2)
Internal Migrants	23	5.1 (3.3 – 7.6)
Internally displaced	19	4.2 (2.6 – 6.6)
Returnees	5	1.1 (0.4 – 2.7)
Origin (for Non residents; N=47)		
Within the district	14	29.8
Within the region (Lower Juba)	16	34.0
Within Somalia	5	10.6
Outside Somalia (e.g. Kenya)	12	25.5
Duration of Stay (N=47)	Mean = 8.8 mo; SD=14	
Main Reason for movement (n=47):		
Fighting/ civil insecurity	3	6.4
Lack of employment	4	8.5
Food shortage (hunger)	18	38.3
Water shortage	22	46.8

Most (89.7%) of the assessed households were residents¹. About 5.1% of the households were internal immigrants; 4.2% were IDPs; while the remaining 1.1% of the households were returnees to these settlements. The non residents were mainly from within the Lower Juba region.

Overall the non residents had stayed in their current locations for an average of about 9 months. The main reasons for movement were drought related water and pasture shortage (46.8%) and food shortage/hunger (38.3%). Others moved in for search of

employment (8.5%) or for civil insecurity (6.4%) reasons.

Table 4: Distribution of households by means of livelihood and Source of Income

	N	% (CI)
Livelihoods (N=455)		
Pastoral	184	40.4 (35.9 – 45.1)
Agro-pastoral	179	39.3 (34.9 – 44.0)
Urban	92	20.2 (16.7 – 24.3)
Main Source of Income (N=455)		
Sale of animals (& products)	190	41.8 (37.2 – 46.5)
Casual labour	147	32.3 (28.1 – 36.9)
Petty trade	78	17.1 (13.9 – 21.0)
Crops sales	27	5.9 (4.0 – 8.6)
Salaried employment	5	1.1 (0.4 – 2.7)
Remittances/ gifts	4	0.9 (0.3 – 2.4)
Others (hunting/gathering; sheikh,)	4	0.9 (0.3 – 2.4)

Majority of the assessed households were either pastoral (40.4%) or agro-pastoral (39.3%) while the rest 20.2% were in urban livelihoods. Sale of animal products (41.8%) and casual/farm labour (32.3%) were the two main sources of income to most households. Some 17.1% households depended on petty trade as their source of income. Crop

sales (5.9%), employment (1.1%) and remittances (0.9%) were other sources of household income. A few (0.9%) others depended on hunting; gathering or sheikh-ship.

4.2 Water Access and Quality

Most (75.8%) of the assessed households drew water from unprotected water sources like water catchments (61.3%) or wells (14.5%). Only 24.2% of the households relied on water from

¹ Residents were taken as those who dwelt in the places of their residences for an extended period or permanently

protected wells.

Table 5: Water Access and Quality

	N	(%)
Main source of drinking water (N=455):		
Unprotected well	66	14.5 (11.5 – 18.2)
Protected wells	110	24.2 (20.4 – 28.4)
Water catchments	279	61.3 (56.7 – 65.8)
Water fetching time (N=455):		
< 30 minutes	45	9.9 (7.4 – 13.1)
30 – 59 minutes	189	41.5 (37.0 – 46.2)
1 – 2 hours	107	23.5 (19.7 – 27.7)
> 2 hours	114	25.1 (21.2 – 29.3)
Number of clean water containers:		
1 - 2 containers	195	42.9 (38.3 – 47.6)
3 - 4 containers	135	29.7 (25.6 – 34.1)
5 containers	67	14.7 (11.7 – 18.4)
> 5 containers	58	12.7 (9.9 – 16.2)

There was a association between the source of water and incidences of diarrhoea. Those who drew their water from protected sources were less likely ($0.80 < RR = 0.87 < 0.95$; $p < 0.001$) to experience diarrhoea episodes than those who drew their water from unprotected sources.

A lot of time is spent on water fetching with most (90.1%) of the households taking 30 or more minutes to and from the water source including waiting time. Households also have few and insufficient clean water storage and collecting containers implying that they require frequent trips to fetch water. About 43% of the households have only 1-2 containers for fetching or storing water. SPHERE (2004) guidelines recommend a minimum of 2 clean containers of 10-20 litres for water collection alone, in addition to enough storage containers to ensure there is always water in the household.

4.3 Sanitation and Hygiene Practices

Majority (66.4%) of assessed households had no access to sanitation facilities and used the bush. Traditional pit latrines (31.0%), improved ventilated pit latrines (2.0%) and open pits were reported as the commonly used sanitation facilities. In most (86.9%) of the cases, the distance between latrine and water source was 30 meters or more as recommended by SPHERE (2004).

Table 6: Sanitation & Hygiene

Sanitation and hygiene	n	% (CI)
Access to Sanitation facility (N=455)		
VIP latrines	9	2.0 (1.0 – 3.9)
Traditional pit latrine	141	31.0 (26.8 – 35.5)
Open pit	3	0.7 (0.2 – 2.1)
No latrine at all (Bush)	302	66.4 (61.8 – 70.7)
Distance from latrine to water source (N=153)		
< 30meters	20	13.1
≥ 30 meters	133	86.9
Washing agent used in the household (N=455)		
Soap	325	71.4 (67.0 – 75.5)
Ash	89	19.6 (16.1 – 23.6)
Plant extracts	24	5.3 (3.5 – 7.9)
Shampoo	6	1.3 (0.5 – 3.0)
None	11	2.4 (1.3 – 4.4)
Method of Food Storage (N=455)		
Suspended in hooks/ropes	15	3.3 (1.9 – 5.5)
Put in pots beside fire	138	30.3 (26.2 – 34.8)
Put in covered containers	159	34.9 (30.6 – 39.5)
Don't store	143	31.4 (27.2 – 35.9)

Most (71.4%) of the assessed households used soap for washing. About 20% used ashes while 1.3% of the households used extracts from plant parts. Some 2.4% did not use any washing detergent at all.

About one third (31.4%) of the households assessed did not store any food. However 34.9% stored food in covered containers while 30.3% store food in pots besides fire. Some 3.3% of the households suspend their food in ropes/hooks.

4.4 Health Seeking Behaviour

Table 7: Health seeking behaviour

	N	%
<i>Seek healthcare assistance when a member is sick (N=633):</i>		
Yes	606	95.7 (93.8 – 97.1)
No	27	4.3 (2.9 – 6.2)
<i>Where (n=606):</i>		
Private pharmacy/clinic	322	53.1 (49.1 - 57.2)
Own medication	136	22.4 (19.2 – 26.0)
Public health facility	79	13.0 (10.5 – 16.0)
Traditional healer	69	11.4 (9.0 – 14.3)

A large majority (95.7%) of the 633 children who fell sick during two weeks prior to the assessment sought health care assistance, mostly from private clinics/pharmacy (53.1%). Some 13% of the children sought assistance from public health facilities while the rest visited traditional healers (11.4%) or were administered self-prescription/medication by their caregivers.

4.5 Formal and informal support

Table 8: Formal and informal support

About 57% of the households reported having received some informal support during three months prior to assessment. Most of the social support was mainly in the form of small loans (50.2%) or gifts (27.6%). A few households had received remittances from abroad (4.7%) or within Somalia (3.5%).

Formal support was received by 65.3% of the assessed households, with food aid being the main item received (92.3%). Some 6.1% households received veterinary care and a few others received assistance in form of water and animal transport subsidies.

	N	% (CI)
<i>Informal support (N = 455)</i>		
Received:		
Yes	257	56.5 (51.8 – 61.1)
No:	198	43.5 (38.9 – 48.2)
Type of support (N=257)		
Zakat from better off households	36	14.0
Remittances within Somalia	9	3.5
Remittances from abroad	12	4.7
Gifts	71	27.6
Loans	129	50.2
<i>Formal support (N = 455)</i>		
Received:		
Yes	297	65.3 (30.4 – 39.3)
No	158	34.7 (60.7 – 69.6)
Type of support (N=297)		
Free food	274	92.3
Veterinary care	18	6.1
Others (animal transport; water)	5	1.6

4.6 Characteristics of assessment children

Table 9: Distribution of children according to age and sex

Age	Boys		Girls		Total		Ratio
	n	%	n	%	n	%	
6-17 months	107	22.6	115	26.8	222	24.6	1: 0.93
18-29 months	138	29.1	112	26.1	250	27.7	1: 1.23
30-41 months	115	24.3	98	22.8	213	23.6	1: 1.17
42-53 months	86	18.1	83	19.3	169	18.7	1: 1.04
54-59 months	28	5.9	21	4.9	49	5.4	1: 1.33
Total	474	52.5	429	47.5	903	100	1: 1.10

A total of 903 children were assessed from 455 households of whom 52.5% were boys and 47.5 % were girls. The ratio of boys to girls was 1:0.91.

4.7 Nutritional status of assessment children using anthropometry

Table 10: Summary of Global Acute malnutrition and Severe Acute Malnutrition

Malnutrition Rates	No	Proportion
Global Acute Malnutrition (<-2 Z score or oedema)	199	22.0 (19.4 – 24.9)
Severe Acute Malnutrition (<-3 Z score or oedema)	38	4.2 (3.0 – 5.8)
Oedema	6	0.7 (0.3 – 1.5)

The global acute malnutrition using WFH Z score (<-2 z-scores or oedema) was 22.0% (CI: 19.4 - 24.9) while severe acute malnutrition (<-3 z-score or oedema) was 4.2 % (CI: 3.0 - 5.8). Six cases of oedema were detected during the

assessment. Distribution of the weight-for-height scores (mean=-1.01; median=-1.18; SD=1.35) were skewed towards the left depicting a poorer nutrition situation according to international (WHO) standards (Fig 3).

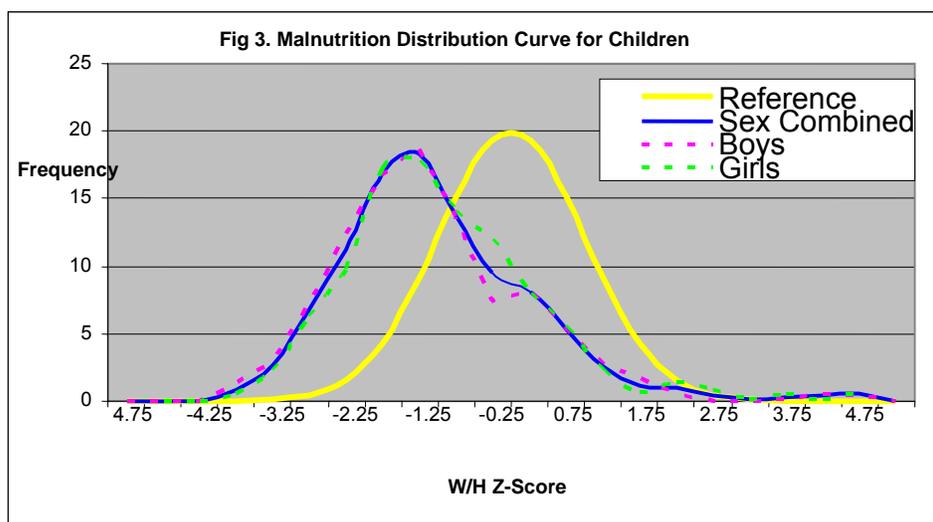


Table 11: Distribution of children by nutritional status (WHZ-score or oedema) and child sex

Nutrition status categories	Males		Females		Total	
	No	% (CI)	No	% (CI)	No	% (CI)
Global acute malnutrition (WFH<-2 z score/oedema)	115	24.3 (20.5 – 28.4)	84	19.6 (16.0 – 23.7)	199	22.0 (19.4 – 24.9)
Severe acute malnutrition (WFH <-3 z score/oedema)	23	4.9 (3.2 – 7.3)	15	3.5 (2.0 – 5.8)	38	4.2 (3.0 – 5.8)
Oedema	3	0.6 (0.2 – 2.0)	3	0.7 (0.2 – 2.2)	6	0.7 (0.3 – 1.5)

About 24% of boys and 20% of girls were acutely malnourished in the assessed Afmadow/ Hagar population using weight for height <-2 Z score or presence of oedema, the level of malnutrition was however not significantly different ($p>0.05$) among the two sexes. Malnutrition rates were consistently high across all the age groups with no statistical difference between the breastfeeding age (6-24 months) and the rest (25-59 months) children.

Table 12: Distribution of Acute Malnutrition by Age

Age groups	Severe (WH<-3Z)	Moderate (WH>=-3Z<-2Z)	GAM (Total malnourished-WH<-2Z)	Normal (WH>=-2Z)	Total
6-17 months	14 (6.3%)	35 (15.8%)	49 (22.1%)	173 (77.9%)	222 (24.6%)
18-29 months	6 (2.4%)	38 (15.2%)	44 (17.6%)	206 (82.4%)	250 (27.7%)
30-41 months	9 (4.2%)	47 (22.1%)	56 (26.3%)	157 (73.7%)	213 (23.6%)
42-53 months	9 (5.3%)	30 (17.8%)	39 (23.1%)	130 (76.9%)	169 (18.7%)
54-59 months	0 (0%)	11 (22.4%)	11 (22.4%)	38 (77.6%)	49 (5.4%)
Total	38 (4.2%)	161 (17.8%)	199 (22.0%)	704 (78.0%)	903 (100%)

Table 13: Malnutrition prevalence using WFH percentage of median categories

Nutrition status categories	Males		Females		Total	
	No	Proportion (%)	No	Proportion (%)	No	Proportion (%)
Global acute malnutrition (WFH<80% or oedema)	80	16.9 (13.7 – 20.6)	58	13.5 (10.5 – 17.2)	138	15.3 (13.0 – 17.8)
Severe acute malnutrition (WFH<70% or oedema)	10	2.1 (1.1 – 4.0)	7	1.6 (0.7 – 3.5)	17	1.9 (1.1 – 3.1)

The global acute malnutrition among children aged 6 - 59 months using weight for height <80% of median or presence of oedema was 16.9% (CI: 13.7 - 20.6%), while the severe acute malnutrition <70% of median or presence of oedema was 2.1% (CI: 1.1 – 4.0%).

Using mid upper arm circumference (MUAC) measurements for children aged 12-59 months, 19.7% (CI: 17.0 – 22.7) of the children were malnourished (MUAC<12.5 cm or oedema). About 3.5% (CI: 2.4 – 5.0) were severely malnourished (MUAC<11.0 cm or oedema) while 24.7% (CI: 21.8 – 27.8) were at risk (MUAC 12.5-<13.5 cm).

Table 14: Nutrition status of Children by MUAC

Malnutrition	Males		Females		Total (N=807)	
	N	%	N	%	N	% (95% CI)
Severe (MUAC <11 cm) or oedema	15	3.5 (2.0-5.8)	13	3.4 (1.9-6.0)	28	3.5 (2.4-5.0)
Total (MUAC <12.5 cm) or oedema	80	18.6 (15.1-22.7)	79	20.9 (17.0-25.4)	159	19.7 (17.0-22.7)
At risk (MUAC 12.5- <13.5 cm)	97	22.6 (18.8-26.9)	102	27.0 (22.6-31.8)	199	24.7 (21.8-27.8)
Normal (MUAC >=13.5 cm)	252	58.7 (53.9-63.4)	197	52.1 (47.0-57.2)	449	55.6 (52.1-59.1)
Total	429	53.2 (49.6-56.6)	378	46.8 (43.4-50.4)	807	100

4.8 Morbidity, measles immunisation, polio vaccination and vitamin A supplementation

Table 15: Morbidity, measles immunisation, polio vaccination and vitamin A supplementation

	No.	%(CI)
<i>Incidence of major child illnesses (N=903)</i>		
ARI within two weeks prior to assessment	350	38.8 (35.6 – 42.0)
Diarrhoea within two weeks prior to assessment	313	34.7 (31.6 – 37.9)
Febrile illness (suspected malaria) within 2 weeks prior to assessment	177	19.6 (17.1 – 22.4)
Measles within one month prior to the assessment (N=862)	119	13.8 (11.6 – 16.3)
<i>Immunization Coverage (N=903)</i>		
Children (9-59 months) immunised against measles (N=862)	755	87.5 (75.0 – 89.6)
Children who have ever received Polio dose (N= 903)	758	83.9 (81.3 – 86.2)
<i>Vitamin A supplementation (N= 903)</i>		
Children who received Vitamin A supplementation in past 6 months or before	290	32.1 (29.1 – 35.3)
<i>Micronutrients Deficiencies (N=455)</i>		
Households who reported night blindness (N=455)	18	4.0 (2.4 – 6.3)
Member with night blindness (n=10):		
< 5 years	5	27.8
≥ 5 years	13	72.2

The incidences of ARI (38.8%), diarrhoea (34.7%) and febrile illness (19.6%) within two weeks prior to the assessment were high but no disease outbreak was reported during the period. The incidence of suspected measles among children one month prior to the assessment was 13.8%.

Measles vaccination coverage for eligible children (9-59 months old) was 87.5%. Most (83.9%) of the children aged 6-59 months had received at least a dose of polio vaccine. About one-third (32.1%) of the assessed children had received Vitamin A supplementation in the 6 months prior to the assessment. Except for vitamin A supplementation, coverage was high for the immunization programmes as a result of the recent campaigns by UNICEF, WHO and local partners.

4.9 Vitamin A Deficiency

About 4% of the households reported cases of night blindness, which is a proxy indicator for vitamin A deficiency. About one-quarter (27.8%) of these night blindness cases were reported among children less than five years.

4.10 Feeding practices

None of the assessed children were exclusively breastfed for the recommended first six months and only 39% of the children aged 6-24 months were breastfeeding at the time of the assessment. About two-thirds of the children who were breastfeeding were breastfed on demand as recommended. Of those who had stopped breastfeeding, about 11% had stopped breastfeeding before six months of age, 38.5% before their first birthday and the rest (49.7%) within their second year of life.

Table 16: Children feeding practices

Children aged 6-24 months (N=427)	N	% (CI)
<i>Is child breastfeeding?</i>		
Yes	165	38.6 (34.0 – 43.5)
No	262	61.4 (56.5 – 66.0)
<i>Breastfeeding frequency (N=165)</i>		
1-2 times	3	1.8 (0.4 – 5.2)
3-6 times	56	33.9 (26.8 – 41.7)
On demand	106	64.2 (56.4 – 71.5)
<i>Age stopped breastfeeding (N=262):</i>		
0 - 5 months	28	10.7 (7.2 – 15.1)
6 - 11 months	101	38.5 (32.6 – 44.7)
12 – 18 months	102	38.9 (33.0 - 45.1)
More than 18 months	31	11.8 (8.2 – 16.4)
<i>Introduction of Complementary feeding</i>		
0 - 3 months	382	89.5 (86.1 – 92.1)
4 – 5 months	23	5.4 (3.5 – 8.1)
6 or more months	22	5.2 (3.3 – 7.8)
<i>Feeding frequency:</i>		
Once	69	16.2 (12.9 – 20.1)
2 times	149	34.9 (30.4 – 39.7)
3 – 4 times	174	40.7 (36.1 – 45.6)
5 or mores times	35	8.2 (5.9 – 11.3)

Most (89.5%) of the children aged 6-24 were introduced to foods other than breast milk early in life between the time of birth and the third month of life. About 5% were introduced to complementary feeding at 4-5 months and the rest (5.2%) were initiated to complementary feeding at 6 months or more.

Less than half (48.9%) of the assessed children were fed at least thrice a day with mainly cereal-based diets. The majority were fed 3-4 times (40.7%). Slightly less than one-third (30.4%) were fed 2 times while 16.2% of the children were fed only once.

4.11 Dietary Diversity

Table 17: Distribution of dietary diversity among households

No of food groups consumed (N=455)	N	% (CI)
1 food group	17	3.7 (2.3 – 6.0)
2 food groups	37	8.1 (5.9 – 11.1)
3 food groups	66	14.5 (11.5 – 18.2)
4 food groups	121	26.6 (22.6 – 31.0)
5 food groups	131	28.8 (24.7 – 33.2)
6 food groups	37	8.1 (5.9 – 11.1)
7 food groups	20	4.4 (2.8 – 6.8)
8 food groups	18	4.0 (2.4 – 6.3)
9 food groups	6	1.3 (0.5 – 3.0)
10 food groups	2	0.4 (0.1 – 1.8)
1-3 food groups	120	26.4 (22.4 – 30.7)
≥ 4 food groups	335	73.6 (69.3 – 77.6)
Mean HDDS	4.4	SD=1.7
<i>Main source of food (N=455)</i>		
Purchasing	432	90.8 (87.7 – 93.1)
Own production	38	8.0 (5.8 – 10.9)
Gifts/donations	3	0.6 (0.2 – 2.0)
Bartering	3	0.6 (0.2 – 2.0)

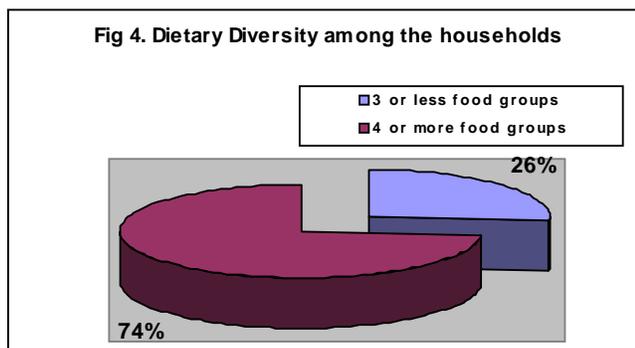
As shown on table 17, more than one-quarter (26.4%) of the households had consumed three or fewer food groups within 24 hours prior to the assessment (Fig 4). About 4% had consumed only one food group while majority had consumed 4-5 food groups within the same period.

Households consumed an average (HDDS) of 4.4 food groups (SD=1.7) with the number of food groups consumed ranging from one to ten.

Cereal-based diets were the most commonly consumed by the assessed households (97.8%). Other food items commonly consumed were milk (77.1%), sugar as tea (75.4%), and oil (68.4%).

Fruits (7.5%), vegetables (7.7%), eggs (7.7%) and roots (9.5%) were consumed only by a few households.

Most (85.3%) of the households assessed mainly obtained their food through purchasing, 10.3% relied on food aid and 2% on borrowing. Other households obtained most of their food through own production (1.1%), gifts/food remittance (0.7%), bartering (0.4%) or hunting/gathering (0.2%).



4.12 Adult Malnutrition by MUAC

Table 18: Adult nutrition status by MUAC

	n	%	95% CI
<i>Non Pregnant (N=311)</i>			
Severe acute malnutrition (MUAC<16.0 cm)	4	1.3	0.4 – 3.5
Global acute malnutrition (MUAC≤18.5)	11	3.5	1.9 – 6.4
Normal	300	96.5	93.6 – 98.1
<i>Pregnant women (N=126)</i>			
Severe Risk (MUAC≤20.7 cm)	23	18.3	
Total at risk (MUAC≤23.0 cm)	63	50.0	
Normal	40	31.7	

About 3.5% of non-pregnant women (aged 15-49 years) were malnourished (MUAC<18.5cm) while 1.3% were at severe risk of malnutrition (MUAC<16.0 cm) (N=311).

One half (50%) of pregnant women (N=126) were malnourished (MUAC<23.0cm) while 18.3% were at severe risk of malnutrition (MUAC<20.7cm).

4.13 Relationship between malnutrition and other factors

Table 19: Risk factors and relation to total malnutrition (WHZ<-2)

Exposure variable	N	(%)	Crude RR	95% CI	p-value
<i>Child sex:</i>					
Male	115	24.3	1.13	0.99 – 1.30	0.11
Female	84	19.6			
<i>Age group</i>					
6-24 months	88	20.6	0.92	0.77 – 1.09	0.37
25-59 months	111	23.3			
<i>Hygiene</i>					
<i>Source of water</i>					
Protected sources	35	15.7	0.66	0.48 – 0.91	0.01*
Unprotected sources	164	24.1			
<i>Washing detergent:</i>					
Use soap	138	21.4	0.96	0.87 – 1.07	0.54
Does not use soap	61	23.6			
<i>Morbidity patterns</i>					
<i>Illness</i>					
Yes	150	23.7	1.10	1.00 - 1.21	0.008*
No	49	18.1			
<i>ARI</i>					
Yes	94	26.9	1.30	1.09 - 1.55	0.007*
No	105	19.0			
<i>Diarrhoea:</i>					
Yes	94	29.7	1.50	1.24 – 1.80	0.00007*
No	106	18.0			
<i>Health programmes</i>					
<i>Vitamin A Supplement:</i>					
Yes	71	24.5	1.15	0.92 – 1.42	0.26
No	128	20.9			
<i>Measles vaccine (N=862)</i>					
Yes	172	22.8	1.07	1.02 – 1.13	0.03*
No	14	13.0			
<i>Dietary & feeding patterns</i>					
<i>Breastfeeding (N=427)</i>					
Yes	32	19.4	0.93	0.68 – 1.26	0.71
No	56	21.4			
<i>Dietary diversity</i>					
≤ 3 food groups	46	23.0	1.06	0.79 – 1.41	0.78
≥ 4 food groups	153	21.8			

Malnutrition rates were higher among children from households obtaining their drinking water from unprotected sources (p=0.01) than those drinking from protected water sources. Further analysis showed association between diarrhoea and type of water source (p=0.001) and between malnutrition and diarrhoea (p=0.00007).

Malnutrition showed significant associations with morbidity and was higher among those who had been ill (p=0.008) and between diarrhoea and ARI incidences (p=0.007).

Surprisingly, malnutrition rate was higher among children who had received measles vaccine (p=0.03) than those who had not.

Further analysis revealed no significant association between malnutrition and other factors.

4.14 Death rates

A total of 899 households were assessed for mortality indicator with a recall period of 90 days prior to the assessment being used. The results generated by the Nutrisurvey software were as presented below:

Death rates;

For children aged 0-59 months (under-five mortality or death rate)

$$\text{0-5DR} = \frac{\text{Number of deaths of children 0-5 years}}{\left(\frac{\text{Mid point Population* of children 0-5}}{10,000} \right) \times \text{Time interval}} = \text{Deaths/10,000/day}$$

* Mid point population = (Population at present + Population at beginning of recall)/2
 Population at beginning of recall = (population present + left + deaths) – (joined + births)

Under five population (mid point) in assessed households	= 1,199
Number of under fives who joined the households	= 2
Number of under fives who left the households	= 5
Number of births	= 13
Number of under five deaths	= 17

Under five death rate (deaths /10,000 children per day) = **1.57** (CI: 0.85 - 2.29)

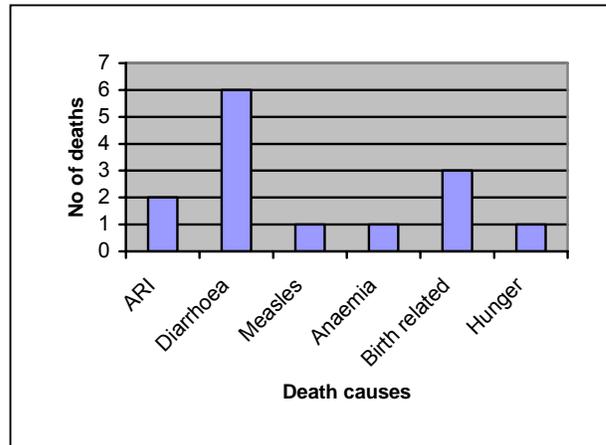
For the total population (Crude mortality/death rate):

$$\text{CDR} = \frac{\text{Number of deaths}}{\left(\frac{\text{Total Mid point Population}}{10,000} \right) \times \text{Time interval}} = \text{Deaths/10,000/day}$$

Total population in assessed households	= 5,286
Total people who joined the households	= 70
Total people who left the households	= 185
Total number of births	= 13
Total number of deaths in the households	= 37

CMR as deaths per 10,000 persons per day = **0.77** (CI: 0.46 - 1.08)

Both under five and crude death rates reflect a normal situation according to the international standards (WHO classification).

Figure 5: Causes of under five mortality

As shown on graph 5, diarrhoeal diseases and ARI were the main factors associated with under-five mortality as reported by the household members interviewed. Other factors associated with child deaths included measles, anaemia, malnutrition and birth related complications.

ARI and malaria were mentioned as the main causes of death among persons over five years of age. Anaemia and cardiovascular diseases were described as possible factors associated with death among adults and children over five years.

4.15 Qualitative information

Qualitative information was collected from observations, focus group discussions and key informants. A total of 30 focus group discussions were held, one per cluster with mothers and with men (elders). The discussions were centred on feeding and care practices, health care, food security, and water and sanitation issues.

4.15.1 Care and feeding practices

Breast feeding and complementary feeding practices were found to be sub-optimal in the district. Qualitative information indicated that mothers give water and sugar (*fax*) within a few hours after delivery and start breastfeeding late, between 24 - 48 hours. The women claim that if they breastfeed immediately, the child may get diarrhoea or 'constipation', that the mother has no milk or the baby lacks strength to suckle, the mother has abdominal pains and that breastfeeding increases bleeding. In addition to the *fax* and breast feeding, the infants are introduced to milk, preferably camel milk if available after one week while other semi solid foods such as porridge are introduced at between 2 and 3 months. Solid foods are introduced at 6-7 months.

The most common foods fed to young children are light porridge made from sorghum maize flour with sugar and milk added. Rice with milk, sugar and ghee, oil, tea with milk, spaghetti and *caanjero* (Somali pancake) are among other foods fed to the children. Children are usually fed four or more times a day in normal times. This had not changed significantly during the assessment since more than two thirds (72%) of the children were fed at least three times a day. The quality has also been compromised. Milk is less consumed by children due to less calving rate during Deyr 05/06 and higher culling rate during drought. No ghee is currently available in the whole area. It was noted that children were always given priority in feeding during normal and crisis times. It was also noted that many households had no access to milk, (milk is usually a key food for children). Camel milk, for instance was inaccessible in many parts except in the southern part of the district. Hence children from the very poor families were being fed mainly on sorghum, wheat or maize porridge and occasionally rice or *caanjero*.

Qualitative data further revealed that when children are sick certain foods are withheld, for example if a child has diarrhoea, fresh milk is withheld, while fatty foods (ghee, oil, meat) were withheld for those with measles or malaria. Pregnant women however, have no food restrictions; instead they are encouraged to eat more. Caregivers also noted changes in care practices for children since mothers spent a lot of time outside the home looking for casual work or attending their petty businesses, or fetching water and firewood. Many children are therefore left taking care of their younger siblings thereby affecting childcare.

4.15.2 Food security situation in Afmadow/ Hagar

Livelihood:

The community mainly depend on livestock and livestock product sales with a little bit of agricultural-products. The soils are fertile and well covered with grass and because of that, it inhabits the largest portion of cattle population of Somalia. Afmadow community had neglected farm cultivation due to poor farm input and knowledge and due to availability of cheaper cereals from the riverine that discouraged the farmers from growing crops. This has reduced crop production rate to the lowest ever recorded comparing to post war average (PWA.).

Hagar community practices more farming than Afmadow but receives less rain, which negatively affected the crop production and drew out more valuable cash from the agro-pastoral households. Their current main food source is staple food purchase and negligible quantity of own production of agro-pastoral products mainly cattle and maize. About 40-50% of cattle have died during the drought due to poor pasture, long walking and drought related diseases. Most of cattle deaths were among the herds that migrated from Kenya and Gedo regions.

Rainfall

In April, almost every part of the districts received *Gu* rains though the intensity and coverage was poor but later improved in some parts. Afmadow, Qoqani, Hayo, Tabta, Doblei, Dif, Hagar, Qalawilley, Bulu-Abasgul, Fafurow, Fandoofaar, Jamar, Fanqal, Dhati and further north of Hagar nomadic settlements all received normal rainfall but west of Hagar, Jaldeyse, Dardaar received below normal *Gu* rainfall. It is estimated that overall *Gu* rainfall will be near normal.

Water & Pasture

The current *Gu* rainfall had replenished most of the water catchments and natural ponds in the districts. Water was available and accessible freely to both human and livestock and was expected to remain unchanged throughout the month. Previous rains had regenerated the pasture and improved its condition to normal except some parts of west Hagar area between Hawina to Jaldeyse of Afmadow district, which received below normal rainfall. There is high army worms population at nomadic settlements of Afmadow and Hagar, which destroyed the pasture and many cattle and goats died after they grazed in army worms-affected area.

Crop

About 90% of Afmadow district farms were left fallow because the farmers had experienced high farm input expenses that increase production cost and during the harvesting time cheaper maize comes from the riverine areas that discourage own production. In Hagar, over 90% of the existing farms were planted with maize and sorghum and intercropped with cowpea. High pests (army worms and stock borer) had attacked the standing crop and over 70% were destroyed. Now farmers don't have seeds to replant and the remaining crops are at risk of being infested by these pests. The standing crop condition is poor due to low intensity of rainfall and long dry intervals.

Livestock:

During the drought, 40-50% of cattle which migrated in to the dhasheks and riverine have died and majority of them were calves and old ones due to harmful insect bites and drought related diseases. Now, livestock from Kenyan side could not go back due to poor rainfall and pasture at their original homeland. The death was higher for the cattle which moved long distance and less to the indigenous local herds) All livestock are concentrating at Boji area of Hayo/Afmadow, Jiro planes, north of Hagar, and border area of between Doblei and Dif. Cattle are slowly recovering although very few lactating cattle survived the drought and milk is scarce (Fig 6).

Most of cattle and goats are suffering from various diseases especially trypanosomiasis, tick-borne disease and helminths. Cattle reproduction and milk production are very low and cattle pastoralists remain food insecure as they live on food purchases with limited cash availability. VSF-Swiss provides livestock drugs but not enough to all because the in-migrated livestock from Gedo and North Eastern Province of Kenya doubles livestock population of the districts. No livestock health services support from international NGO was reported and Hagar community and their remaining cattle and goats are suffering from diseases.

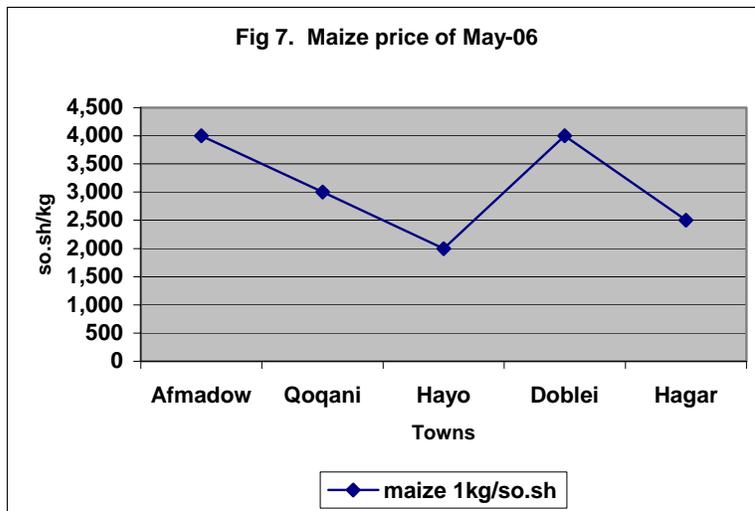


Migration

All livestock had migrated to central and north west of Afmadow and Hagar district. Livestock from Garissa could not return to their home origin because of poor rainfall and pasture. All their livestock are at the border area of between Doblei and Dif while livestock from Gedo remain at Hagar and central part of Afmadow district. Livestock could no longer remain in the south of Afmadow because of high harmful insect population and ticks. Livestock from Kismayo had moved to Bilis-Qoqani/Afmadow avoiding insect bites.

Market/TOT

Cattle didn't recover their body conditions because of diseases that came with the drought. Market value of cattle is still low though there is a good demand at Garissa cattle market. Goat price is normal but cereal prices are high and are expected to increase.

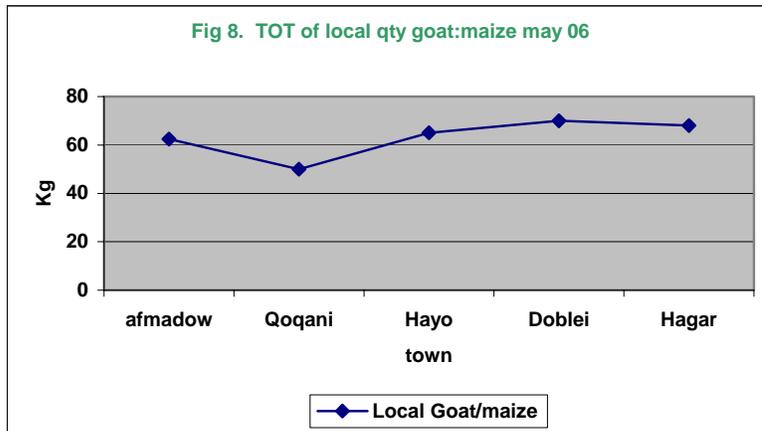


price is normal but cereal prices are high and are expected to increase.

Although goat market price is normal compared to average price of the districts, TOT is low because of high priced cereals and has reduced to 1.5bags of maize/1 local quality goat (1 local qty goat:2bags of maize BL).

TOT may rise soon because the coming two months will be the harvest period and cereal

availability will increase hence lower the prices. However, low production of *Gu* season is expected due to high pests infestation and less area cultivated throughout agro-pastoral area of Afmadow and Hagar.



Food security factors:

Food security situation of these two districts are poor due to the following various factors;

- Very low cattle milk production
- Very low meat consumption due to poor body weight of cattle and goats
- Low livestock income sales, which is their main income source
- Low purchase power
- High priced maize available at the market
- High imported food price
- Poor agro labour income
- Poor self-employment income because of low access
- Low food supply at the markets due GU rains, which blocked the earth roads
- Markets became in active due to mud and rainwater, which hindered transport movement.

4.15.3 Health related issues

The most common diseases among children reported at the time of the assessment were ARI and diarrhoea. There were also significant cases of suspected measles. The area has insufficient access to health services and where available, the community felt that the facilities were not providing sufficient quality health care. There is one MCH run by Local NGO in the area of Afmadow with basic medical kit supply from UNICEF. However, other areas have not a single public health post. Referral cases including severely malnourished children have nowhere to seek assistance. Some residents therefore resort to self-prescription and medication.

4.15.4 Coping Strategies:

Qualitative information collected through the focus group discussion revealed that the commonly used coping strategies by many of the households assessed include shift to less preferred foods and reduced home milk consumption, borrowing food from neighbours, limiting portion size at meal times, reducing number of meals, restrict consumption by adults for children to eat and slaughtering of the weak animals before they die among other strategies.

Southeast Pastoral LZ: cattle, sheep & goats

- Reduced home milk consumption
- Consumed less preferable cereals
- Borrowed food on credit from another household
- Reduced number of meals per day
- Consume weak un-saleable animals
- Some times look for hunting
- Selling their best animals

Lower Juba Agro-pastoral LZ: Cattle, maize

- Shifted from high priced cereal varieties to low price cereal varieties
- Borrowed food on credit from shops/ neighbours
- Reduced to the minimum home milk consumption
- Reduced the number of meals in a day by adults
- No milk production and purchase limited quantity of camel milk for child consumption
- Rely on food gifts from clan relatives and friends

5.0 DISCUSSION AND CONCLUSIONS

5.1 Nutrition Situation

The assessment results indicate a Global Acute Malnutrition (Weight-for-Height <-2 Z score or oedema) of 22.0% (CI: 19.4-24.9) and a Severe Acute Malnutrition of 4.2% (CI: 3.0-5.8). This indicates a critical nutrition situation according to WHO classification, in a population just coming from experiencing a period of extreme food and livelihood insecurity. The assessment result ($>20\%$) is worse when compared to the long term estimates of global acute malnutrition (10 – 14.9%) for Afmadow/ Hagar District. The situation is understandable given that the district and the whole region have been hit by successive natural stress of prolonged drought from failure of the previous two main rainy seasons- *Gu* and *Deyr* 2005. The respective crude and underfive mortality rates of 0.77 (CI: 0.46-1.08) and 1.57 (CI: 0.85-2.29) deaths/10,000/day however indicate acceptable levels according to WHO classification. The high proportion of severely malnourished children and low mortality rates is surprising, but could be an indication that mortality rates are likely to rise in the next few weeks if the situation is not arrested immediately. There is no rehabilitation (therapeutic feeding) centre in the district and the nearest TFC is in Marere, about 100 km away. The TFC in Marere continually records high admission cases in the region from as far as Afmadow and Hagar areas.

Malnutrition showed significant associations with morbidity and was higher among those who had been ill ($p=0.008$) and between diarrhoea ($p=0.00007$) and ARI incidences ($p=0.007$) during two weeks prior to the assessment. Further analysis showed association between diarrhoea and type (protected or unprotected) of water source ($p=0.001$). A widespread measles outbreak experienced in the previous 2-3 months in the region and the wider Somalia accounts for the high measles incidences (13.8%). Except for vitamin A supplementation (32.1%), immunization coverage was high (about 84% for polio and 88% for measles) in the assessed households as a result of the recent immunization campaigns following this outbreak. Surprisingly, malnutrition rate was higher among children who had received measles vaccine ($p=0.03$) than those who had not. This could possibly mean many of the children who received the measles vaccine already had measles or suffered other illnesses that superimpose malnutrition. Measles vaccine is usually given together with vitamin A supplements, however this did not happen as the health facilities had run out of stock, hence the low coverage recorded for vitamin A supplementation.

5.2 Food Consumption and Food Security

Residents are just coming from experiencing the impact of a prolonged drought. Food stocks were depleted; households obtain food through purchasing with a significant proportion relying on food aid (10%). Households are coping with less diversified (maize-based) diets with reduced home consumption of milk attributed low calving rate during *Deyr* 05/06 season and high culling rate (slaughtering calves to save parent livestock) during the drought period. Dietary diversity has declined with the drought and more than one quarter (26%) of the households consume only three or fewer food groups. Qualitative information reveals that most of the district received good rains in April and pasture has been replenished but animal reproduction and lactation is still minimal from the gradual body recovery and given that a high proportion of the cattle, goats and sheep were lost (died of starvation, feeding on pest infested pasture or other drought related illnesses). During drought there was no market of cattle for instance. In fact the main market for cattle collapsed. and therefore milk availability is insufficient. Most of the farms have been planted with maize and sorghum, but the standing stock faced the dangers of pest (army worms and stock borer) attack as well below normal rainfall. Lack and high costs of seeds to replant some farms is also a constraint. Cereal prices are high and the decline in terms of trade (TOT) further reduces the purchasing power of the locals for example one local quality goat is exchanging for only 1.5 bag of maize instead of 2 bags during similar baseline period.

5.3 Water, Sanitation and Health issues

Most of the population draw water from unprotected water catchments or wells. Most of these catchments that had dried up during the drought are now replenished with water. Water is therefore available and accessible to both human and livestock and this is expected to remain so for the next month, its quality notwithstanding. However, a lot of time is still spent on water fetching with most (90.1%) of the households taking at least 30 minutes to and from the water source including waiting time; and households have few and insufficient clean water storage/collecting containers implying that they require frequent trips to fetch water. About 43% of the households have only 1-2 containers for fetching or storing water yet SPHERE (2004) guidelines recommend a minimum of 2 clean containers of 10-20 litres for water collection alone, in addition to enough storage containers to ensure there is always water in the household.

The general sanitation of the population's residential areas is poor. Access to sanitation facilities is very low with majority (66%) using bush. Traditional pit latrines are the most commonly used among those with access to sanitation facilities. Household hygiene is suboptimal and appropriate food and water storage methods not used. This together with poor drinking water quality has contributed to incidences of diarrhoea. Results indicate that unprotected water sources were associated with diarrhoea ($p=0.01$) and that malnutrition was in turn significantly associated with incidences of diarrhoea ($p=0.00007$).

6.0 RECOMMENDATIONS

Following discussions held after sharing the results with partners and detailed data analysis, both short- and long-term recommendations were made:

6.1 Short term recommendations:

1. The observation of many oedema and marasmus cases in Afmadow and Hagar districts calls for an establishment of a management system (health facility-based) for severe malnutrition cases within the district.
2. As food security continues to deteriorate, interventions that improve household access to food are indicated for the next 2-4 months.
3. Continuation and intensification of health, water and sanitation interventions especially immunization programs, rehabilitation and protection of water points and provision of sanitary facilities. Measles immunization should be accompanied with Vitamin A supplementation in future immunization campaigns.

6.2 Long-term Recommendations

1. It is highly recommended that the local MCHs / local health personnel are equipped with the knowledge and skills to manage severe malnutrition (especially community-based) both during and outside periods of crisis.
2. Improve access to quality for medical/health care through establishment of health clinics or outreach programme in Afmadow and Hagar.
3. Health/nutrition education for the population focussing especially on appropriate child feeding practices and management of diarrhoeal diseases.
4. The situation in the Afmadow, Hagar and the neighbouring districts would require close surveillance of the nutrition and morbidity to prompt appropriate intervention for any adverse changes.

:

7.0 APPENDICES

Appendix 1: Sampling Frame for the Afmadow Nutrition Assessment, May 2006

District	Location	Pop.Est	Cumulative	Number of clusters	
Afmadow	Town	12250	12250	1, 2, 3, 4, 5,	
	Qaysangur	400	12650		
	Guri jab	700	13350		
	Anateel	300	13650		
	Bula fulay	270	13920		
	Tortora	250	14170	6,	
	Gomees	250	14420		
	Atay Jalati	400	14820		
	Kukubeyn	230	15050		
	Kalagurey	270	15320		
	Tawakaley.	130	15450		
	New	Galgalo	320	15770	
	New	Go,doonka	450	16220	
Arbo dhabo		400	16620		
Hinafa		250	16870	7,	
Qaba		200	17070		
Hayo		750	17820		
Furso		200	18020		
A.qarajo		300	18320		
Hufo		300	18620		
Malka Bule		450	19070		
Warese		400	19470	8,	
Qoqani	Walisa	250	19720		
	Walis boor	248	19968		
	Qoqani	1350	21318		
	Deeka	200	21518		
	Dalohaar	250	21768		
	Findigo	350	22118	9,	
	Jirmo	330	22448		
	Malmalka	180	22628		
Taabta	Tokosho	300	22928		
	Garasor	500	23428		
	tabta	800	24228		
	Alangohuba	200	24428		
	Kuyis	40	24468	10,	
	Shani	50	24518		
	Hadaa	400	24918		
	Gomera	300	25218		
	G.Busiya	300	25518		
	Ged hola	100	25618		
	Galaf	400	26018		
	Surmole	400	26418		
	Doblei town		10285	36703	11, 12, 13, 14,
Lak dhuub		50	36753		
Alango bilisa		40	36793		
Shaf duug		300	37093		
Qolayjoga		350	37443	15,	

	Lagdhera	300	37743	
	Bisiq dhere	200	37943	
	Dhagaxa	80	38023	
	Dhakaje	100	38123	
	Jirole	120	38243	
	Iskudarka	130	38373	
	Degalama	400	38773	
	Dufeysyaha	200	38973	
	Quley jogo	100	39073	
	Labida Osm.Jey	100	39173	
	Labida Dhooble	55	39228	
	Hawina	1000	40228	16,
	Kaligi qaate	150	40378	
	Lan madow	300	40678	
	Nus dariiq	295	40973	
	Sharifada	230	41203	
	Weelka dhoblei	200	41403	
	Bisiq dhere	100	41503	
	Berjin	340	41843	
	Handarako	120	41963	
	Bisan Abi	50	42013	
	Kombolosh	300	42313	
	Goba waraf	175	42488	17,
	Kaymo	40	42528	
	B.habina	200	42728	
	Qufaca	250	42978	
	H.Dabatar	200	43178	
	Nagas ulu	70	43248	
	Ali Buley	500	43748	
	Dhibi	250	43998	
	Sh.Labi	200	44198	
Dif Town	Town	1200	45398	18,
	Shirkaya	280	45678	
	Isku xirka	420	46098	
	Deg marer	150	46248	
	Lanbarka	150	46398	
	Weelcadey	120	46518	
	Dusmo	600	47118	
	Abodiley	300	47418	
Kenya Border	Wardiig	200	47618	19,
	Godka cad	300	47918	
	Basa Barumo	140	48058	
	Laanta shirwa	180	48238	
	Laan Buul	340	48578	
	labi yar yar	100	48678	
	warabaaley	100	48778	
	Geel dhujis	200	48978	
	Tari	400	49378	
	Ireys	40	49418	
	Abaya	370	49788	
	Kins	450	50238	20,
	Dologuya	600	50838	
	Hado	200	51038	
	Xabal tumal	400	51438	

	Haraniqa	410	51848	
	Hayu jera	200	52048	
	Magar	100	52148	
	Sulda Magar	760	52908	21,
	Tasito	320	53228	
	Tolbi	600	53828	
	Xagarso	105	53933	
	Yeya	150	54083	
	Jamar	250	54333	
	Udansala	409	54742	
	Fanqal	470	55212	
	Hindey	420	55632	22,
	Harboole	480	56112	
	Fantoley	320	56432	
	Degmareer	150	56582	
	Doda waajo	150	56732	
	Gubo doofar	335	57067	
	Arboqarso	360	57427	
	Madharug	225	57652	
	handaraf	410	58062	23,
	jana abdala	340	58402	
	Mido	350	58752	
	garaweyne	200	58952	
	malkadadaje	340	59292	
	saadu	450	59742	
	habaala afwah	500	60242	
	kolhadama	100	60342	
	kunbi	250	60592	24,
	Sariiraha	400	60992	
	Godeya	200	61192	
	Maratu	250	61442	
	Musheqa	240	61682	
	Kainbiba	250	61932	
	Wantey	360	62292	
Hagar	Hagar	5000	67292	25, 26,
	Hagar Gel	900	68192	27,
	Bulo Abasgul	950	69142	
	Qalawilley	700	69842	
	Lamadar	80	69922	
	haji Edan	100	70022	
	Aden sadiq	440	70462	
	Basaha	255	70717	28,
	Dhabi	185	70902	
	Wariir	80	70982	
	Lalab	480	71462	
	Qaaray	500	71962	
	Dato	280	72242	
	Buridheer	50	72292	
	Meri bobay	285	72577	
	Hussein Bare	200	72777	
	Basa hiir	150	72927	
	Halgan	900	73827	29,
	Hareri Masawi	200	74027	
	B/Muse	250	74277	

	guri dheer	450	74727	
	Gumargundie	400	75127	
	HareriMaswir	200	75327	
	Didiga	500	75827	30,
	Tosiley	295	76122	
	Balaslabb	305	76427	
	Aden Geedi	225	76652	
	Gorof hari	375	77027	
		77027		
	Sample Interval	2567		
	Random Number	1332		

Appendix 2a: Afmadow Nutrition Assessment Questionnaire

Date _____ Team Number _____ Cluster Number _____ Name of Supervisor _____
 Name of Village/Town _____ Name of section _____ Household Number _____ Name of the household head _____

Q1-12 Characteristics of Household

Q1 Sex of the household head? 1=M, 2=F

Q2 Household size _____

Q3 Number of < 5 years _____

Q4 Household residence status: 1= Residents 2= Internally displaced 3=Returnees 4=Other (specify) _____

If answer to the above is 1, then move to Question 8.

Q5 Place of origin _____

Q6 Duration of stay _____

Q7 Reason for movement: 1= Insecurity 2=Lack of jobs 3= Food shortage 4=Water shortage 5=Others; specify _____

Q8 What is the livelihood systems used by this household? 1= Pastoral 2=Agro- pastoral 3= Business 6=Other (specify) _____

Q9 What is the total size of the land cultivated (ha) _____

Q10 How many cattle does household own (ha) _____

Q11 How many shoats does the household own (number) _____

Q12a: When your child is sick, do you seek assistance 1= Yes 2= No

Q12b: If yes in Q12a, where do you seek assistance: 1= traditional healer 2= private clinic/ Pharmacy 3= Public health facility

Q13-18 Anthropometry for children aged 6 – 59 months (or 65 – 110cm) in the household

Serial No	Name	Q13 Sex (F/M)	Q14 Age in months	Q15 Oedema (Yes/No)	Q16 Height (cm)	Q17 Weight (kg)	Q18 MUAC (cm)
1							
2							
3							

18b: Anthropometry (MUAC) for adult women of childbearing age (15-49 years) present at the household

Sno	Name	Age in years	MUAC	Physiological status 1- Pregnant 2- Lactating 3- Not pregnant & not lactating	Illness in last 14 days? If yes, what?
1					
2					
3					

18c: Anthropometry (MUAC) for adult men in the households at the time of the assessment (over 18 year of age)

Sno	Name	Age in years	MUAC	Illness in last 14 days? If yes, what?
1				
2				
3				

Q19- 28 Morbidity, feeding and immunization status of children aged 6 – 59 months (or 65 – 110cm) in the household.

Sno	Name	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29
		Diarrhoea in last two weeks 1= Yes 2= No	ARI in the last two weeks 1=Yes 2=No	Malaria in the last two weeks 1=Yes 2=No	Measles in last one month 1=Yes 2=No	Vaccinated against measles 1=In past six months (by card) 2=In past six months (Recall) 3=Before six months (by card) 4=Before six months (Recall) 5= None	Vitamin A provided in the last 6 months 1=Yes 2=No	Are you breast feeding the child? 1=Yes 2=No	If not breast feeding, how old was the child when you stopped breast-feeding? 1= Less than 6 months 2= 6 – 11 months 3=12 – 18 months 4=18 months or more 5= Never breastfed	At what age was child given water/ foods other than breast milk 1=0-3 months 2=4-6 months 3=7 months or more.	How many times do you feed the child in a day? 1= Once 2= Twice 3= 3-4 times 4= 5 or more times	How many times has the child ever been given polio vaccine orally 1=1-2 times 2=3 and above 3=Never
1												
2												
3												

Q30a: Does any member of the household have difficult seeing at night or in the evening while other people do not? 1=Yes 2=No

Q30 b: If yes in Q30a, specify the member: 1= <5 years 2= ≥ 5 years

Q 31 Consumption Diversity

Twenty four-hour recall for food consumption in the households: The interviewers should establish whether the previous day was usual or normal for the households. If unusual- feasts, funerals or most members absent, then another day should be selected or alternatively choose on another household.

Food consumption and source of food, frequency and food sources What foods did the members of this household consume in the past 24 hours?	Codes for frequency of consumption 0=none 1= once 2= twice 3=3 times 4=4 times 5=5 or more times		Sources of foods consumed
	Frequency (<5yrs)	Frequency-adults	
Food types			
1			
2			
3			
4			
5			
6			
7			
8			
9			

Q32-37 Access to water (quality and quantity)

Q32 Main source of drinking water 1 = piped 2 = public tap 3 = Tube well/borehole 4= protected well or spring 5 = Rain water 6= unprotect spring and well 7= river 8= other
 Q33 Main source of water for cooking and personal hygiene 1 = piped 2 = public tap 3 = Tube well/borehole 4= protected well or spring 5 = Rain water 6= unprotect spring and well 7= river 8= other
 Q34 Average household water use per day per person for drinking, cooking and personal hygiene is 1= 0-2 litres 2 = 3 – 5 litres 3 = 6-10 litres 4= 11-15 litres 5= more than 15 litres
 Q35 Distance to the nearest water point 1= 0-250 metres 2 = 251 – 500 metres 3= 501 – 750 metres 4 = 751 – 1000 metres 5 = more than 1000 metres
 Q36 Water and systems are maintained such that quantities of water are available 1 = never 2 = sometimes 3 = almost always 4= always
 Q37 Number of clean water collecting containers of 10-20 litres 1= 1-2 containers 2 = 3-4 containers 3 = 4-5 containers 4= more than 5 containers

Q38-42 Sanitation and Hygiene (access and quality)

Q38 Type of toilet used by most members of the household: 1=Improved pit latrine 2 = Traditional pit latrine 3 =Open pit 4 = Bucket 5= Bush 6= Others (specify) _____
 Q39 Number of people who use the same toilet 1= 1-5 people 2= 6-10 people 3 = 11-15 4= 16 – 20 people 5= more than 20 people
 Q40 Household members wash their hands after defecation 1= always 2= often 3=sometimes 4= hardly rarely
 Q41 Household members wash their hands before eating or food preparation 1= always 2= often 3=sometimes 4= hardly rarely
 Q42 Distance between toilet and water source 1 = 0 – 5 metres 2= 6 – 10 metres 3= 11- 20 metres 4 = 21 - 29 metres 5= 30 metres or more

Q43 - 44 Formal and Informal Support or Assistance in last three months (circle all options that apply)

Q43 Informal support received in last three months 1= Yes 2=No

Q43a Amount and Frequency of each

Type of support	Frequency	Amount (Where applicable)
1=Zakat from better-off households		
2=Remittances from Abroad		
3=Remittances from within Somalia		
4=Gifts		
5=loans		
9=Other (Specify) _____		

Q44 Formal international or national aid support received in last three months 1= Yes 2=No

Q44a Amount and Frequency of each

Type of support	Frequency	Amount (Where applicable)
1= Free cash		
2=free food		
3=cash for work		
4=food for work		
5=supplementary food		
6=water subsidy		
7 transportation of animals subsidy		
8=veterinary care		
9=Other (Specify) _____		

Appendix 2b: Afmadow Nutrition Assessment Questionnaire (Somali Version)

Taariikh _____ Nambarka kooxda _____ Nambarka goobta _____ Magaca Kormeeraha _____ Magaca tuulada/magaalada _____
 Magaca xaafadda _____ Nambarka qoyska _____ Magaca madaxa qoyska _____

S1-12 Astaamaha Qoyska

S1 Jinsiga madaxa qoyska 1= Lab 2= Dhedig

S2 Tirada Qoyska _____

S3 Tirada caruurta ka yar shan sano _____

S4 Xaalada deegaan ee qoyska (Goobo geli Jawaab keliya) 1= Deegaan 2 = Soo Barakacay 3 =Dib u soo noqday 4 = Jawaab kale _____

Haddii Jawaabta su'aasha 4aad ay noqoto (1), u gudub su'aasha 8aad.

S5 Meesha uu markii hore ka yimid _____

S6 Mudada uu halkan Joogay (Bil ahaan u qor) _____

S7 Sababta uu u soo guuray 1= Nabadgelyo xumo 2 = Shaqo la'aan 3 = Cunto yaraan 4 = Biyo yaraan 5 = Jawaab kale _____

S8 Waa Maxay qaab nololeedka ugu badan ee qoskani: 1= Reer Guuraa 2= Reer Guuraa iyo Beeraleey 3= ganacsi 6= Jawaab kale

S9 waa immisa baaxadda dhulka aad beerato _____

S10 waa immisa tirade lo'da aad'haysato

S11 waa immisa tirada ariga (Ido iyo Riyo) ee qoyskani leeyahay

S12. a: Ma raadsataa kaalmo caafimaad markuu cunug kaa jiran yahay 1= Haa 2= Maya

12b hadii ay haa tahay Xaggee: 1= dhaqatar dhaqameed 2= rug caafimaad gaar ah/farmashiye 3= Rug caafimaad dadweyne

S13-18 Miisaamidda iyo dhererinta ilmaha da'dooda u dhaxeeyso 6 – 59 bilood (ama 65 – 110cm) ee qoyska

Tirada Taxan	Magac	S13 Jinsi (L/Dh)	S14 Da'da oo bilo ah	S15 Barar (Haa/Maya)	S16 Dherer (cm)	S17 Miisaan (kg)	S18 Cudud Cabir (cm)
1							
2							
3							

18b: Qiyaasta jidhka ee dumarka ku jira da'da dhalikarta (15-49 sano) ee jooga qoyska

Sno	Magaca	Da' oo sanado ah	MUAC	Xaaladda qofka 4- Uur leh 5- Nuujinaysa 6- Uur ma leh, mana nuujinayso	Cudur ma jiray 14kii maalmood ee u dambeeyey? Hadday jawaabtu haa tahay muxuu ahaa ?
1					
2					
3					
4					

18c: Qiyaasta jidhka ee raga jooga qoyska xilliga la sameeyey qiimaynta (ka weyn 18 sano)

Sno	Magaca	da' oo	MUAC	Cudur ma jiray 14kii maalmood ee u
-----	--------	--------	------	------------------------------------

	sanado ah	dambeeyey? Hadday jawaabtu haa tahay muxuu ahaa ?
1		
2		
3		
4		

S19-29: cudurada, quudinta iyo Tallaalka ee caruurta 6 – 59 bilood (ama 65 – 110cm).

NR	Magac	S19:	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29
		Shuban labadii sitimaan ee la soo dhaafay 1= Haa 2= Maya	Oofw areen (burukiito) labadii sitimaan ee la soo dhaafay 1= Haa 2= Maya	Duu mo labadii sitimaan e la soo dhaafay 1= Haa 2= Maya	Jadee co Bishii la soo dhaafay 1= Haa 2= Maya	Laga tallaalay jadeecada 1=lixdii bilood ee la soo dhaafay gudahood (Kaar) 2=lixdii bilood ee la soo dhaafay gudahood (Xusuus) 3=Lix bilood ka hor (Kaar) 4=Lix bilood ka hor (Xusuus) 5=Lama tallaalin	Lixdii bilood ee la soo dhaafay gudahood 1= Haa 2= Maya	Cunuga ma nuujineysaa hadda 1= Haa 2= Maya	Haddii hadda aadan naaska nuujin, imisa jir buu ahaa marka aad ka joojisay 1=lix bilood ka yar 2= 6 - 11 bilood 3= 12 - 18 bilood 4= 18 bilood ama ka badan 5= Lama naasnuujin	Imisa jir buu ahaa cunuga markii la siiyay biyo/cuntadii ugu horeysay ee aan aheyn caanaha naaska 1= 0-3 bil 2= 4-6 bil 3= 7 bil ama ka badan	Imisa jeer baad quudisaa cunuga maalintii 1= hal jeer 2 = laba jeer 3 = 3 - 4 jeer 4 = 5 jeer ama in ka badan	Imisa jeer ayaa afka laga siiyey Talalka dabeysha weligiis. 1= 1-2 jer 2 = 3& ka badan 3 = Lama siin weligiis.
1												
2												
3												

S30 a) Ma jiraa xubin (xubno) qoyska ka mid ah dhibaato xagga aragtida ah qaba habeenkii ama fiidkii, taas oo xubnaha kale aysan la wadaagin ? 1= Haa 2= Maya

S30b) Hadday **S30a** haa tahay, Caddee 1= < 5 Sano 2 = > 5 ano

Q31b. Food consumption patterns assessment

Waraysiyadu waa inay caddeeyaan in maalintii hore ay ahayd mid caadi u ah qaysaskaas. Haddii aanay caadi ahayn- haddii jirtay xaflad, tacsii ama badi xubanaha qoysku haddii ay maqanyihiint, Markaas maalin kale waa in la doorto, haddii kale waa in qoys kale la xusho.

Cuntada la cunay iyo isha ka soo jeeddo, isha dakhliga cuntada lagu soo gadday ka timaado? Maxay xubnaha qoyskan cuneen 24 kii saac ee la soo dhaafay	Code: 0=waxba 1= hal mar 2= laba goor 3=3 goor 4=4 goor 5=5 goor iyo ka badan		Halka laga helo cuntada la isticmaalo
	Noocyada Cuntada	Frequency (<5yrs)	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

S32-37 Helitaanka Biyaha (Tayada iyo Tirada)

S32 Isha ugu badan ee laga helo Biyaha la cabo 1) pipe lagu keenay 2) Tubo 3) Ceel riig ah (mator leh) 4) Ceel daboolan 5) Biyaha roobka 6) war iyo ceel aan daboolnayn 7) Webi 8) meelo kale ,Caddee, ____

S33 halka ugu badan ay ka yimaadaan biyaha wax lagu karsado ama la isku nadifiyo 1)pipe lagu keenay 2) Tubo 3) Ceel riig ah 4) Ceel daboolan 5) Biyaha roobka 6) war iyo ceel aan daboolnayn 7) Webi 8) meelo kale ,Caddee, _____

S34 Celceliska biyaha xubin qoyska ah uu u isticmaalo Karin iyo nadaafadda jirka waa 1= 0-2 litir 2 = 3 – 5 litir 3 = 6-10 litir 4= 11-15 litir 5= Ka badan 15 litir

S35 Fogaanta isha biyo ee ugu dhaw 1= 0-250 mitir 2= 251-500 mitir 3= 501-750 mitir 4= 751-1000 mitir 5= ka badan 1000 mitir

S36 Biyaha iyo habka lagu helaba waa la ilaaliyey sidaa darteed cadadkii loo baahnaa waa diyaar 1= Marnaba 2= Marmar 3= ugu dhawaan had iyo goor 4= Had iyo goor

S37 Tirada Caagaga biyaha lagu aroorto (10-20 litres) ee qoyskan waa 1=1-2 2= 3-4 3= 4-5 5= ka badan 5 caag

S38- 42: Nadaafadda iyo Fayadhawrka

S38 Nooca musqusha ay inta badan xubnaha qoysku isticmaalaan waa 1= Nooca biyaha la raaciyoo 2= Musqusha godka ah oo la sii hagaajiyey 3= Musqusha Godka ah 4= Musqul God oo dusha ka furan 5= Noocyo kale, Caddee _____

S39 Tirada dadka isticmaala isku hal musqul 1= 1-5 qof 2= 6-10 qof 3= 11-15 qof 4= 16-20 qof 5= ka badan 20 qof

S40 sidee bay xubnaha qoysku gacmaha u dhaqdaan Musqusha ka dib 1= Had iyo goor 2= Badanaa 3= Marmar 4= Si dhifdhif ah

S41 Sidee bay xubnaha qoysku u dhaqdaan gacmaha cuntada ka hor ama markay diyaarinayaan cuntada 1= Had iyo goor 2= Badanaa 3= Marmar 4= Si dhifdhif ah

S42 Fogaanta u dhaxeysa Musqusha iyo Isha Biyaha 1= 0-5 mitir 2= 6-10 mitir 3= 11-20 mitir 4= 21-29 mitir 5= 30 mitir iyo ka badan

Q43 -44 Taageerada toosan iyo midda dadban ee qoysku helay 3dii bilood ee la soo dhaafey (goobo geli dhamaan doorashooyinka ku habboon)**Q43** Kaalmo dadban (aan rasmi ahayn) ma helay qoyskan 3dii bilood ee la soo dhaafey?

1= Haa 2=Maya

Q43a Cadadka iyo Inta jeer

Nooca kaalmada	Inta goor	Cadadka (xaddiga) (Markey ku haboon tahay)
1=Zako ka timaado qoysaska ladan		
2=Xawaalad dibadda ka timaadda		
3=Xawaalad ka timaadda wadanka gudahiisa		
4=Deeq		
5=Amaah		
9=Wax kale, _____		

Q44 Kaalmo rasmi ah oo caalami ah ama waddaniyadeed 3dii bilood ee u dambeeyey 1= Haa 2=Maya**Q44a** Caddadka iyo inta goor mid walba.

Nooca Kaalmada	Inta goor	Cadadka (Xaddiga)
1= Lacag bilaash aad ku heshay		
2=Cunto bilaash lagugu siiyey		
3=Lacag aad shaqo ku badalatey (Cash for work)		
4=Cunto aad shaqo ku badalatey (food for work)		
5=Cunto kabiid ahaan lagu siiyey (suppl.Food)		
6=Biyo lagu siiyey kabiid ahaan (subsidy water)		
7= xoolo lagu siiyey gaadiid ceshi		
8=Kaalmo xanaanada xoolaha (veterinary) aad heshay		
9=Kale, caddee _____		

Appendix 4: Traditional Calendar of Events for Afmadow

Traditional Calendar of events (July 2001-December 2005, Afmadow)					
	2001	2002	2003	2004	2005
January- Jilal		52 Carrafo	40Carrafo	28 Carrafo	16Carrafo
February- Jilal		51 Sako	39Sako	27 Sako	15Sako
March- Jilal		50 Safar	38 Safar	26 Safar	14 Safar
April- Gu'		49 Mawlid	37 Mawlid	25-Mawlid	13 Riverine floods Mawlid
May- Gu'		48 Rabicul akhir	36 Iraq war Rabicul akhir	24 Rabicul akhir	12 Rabicul Aakhir
June- Gu'	59 Jamadul Awal	47 Jamadul Awal	35 Jamadul awal	23 jamadul awal	11 Jamadul Awal
July- Haga	58 Jamadul akhir	46 Jamadul akhir	34 Jamadul Aakhir Death of General Gabyow	22Jamadul akhir	10 Jamadul Aakhir
August- Haga	57 Rajab	45 Rajab	33 Rajab	21 Rajab	9 Rajab
September- Haga	56 Shacban	44 Shacbaan	32Shacban	20 Shacbaan	8 Shacban
October- Dayr	55 Soon	43Soon	31 Soon	19 Soon Election of Somali President Mr Abdullahi Yusuf	7Soon
November- Dayr	54 Sonfur	42 Sonfur Buale fighting	30 Sonfur	18Sonfur	6 Sidatal
December- Dayr	53 Sidatal	41 Sidataal	29 Sidatal	17 Sidatal	

Appendix 5: Prevalence of chronic malnutrition based on height for age Z-score

	<i>Males (n=469)</i>		<i>Females (n=455)</i>		<i>Total (N=924)</i>	
	%	No	%	No	%	No
Total chronic malnutrition (HFA<-2 z score)	16.9 (CI: 13.7 – 20.6)	80	13.8 (CI: 10.7 – 17.5)	59	15.4 (CI: 13.1 – 18.0)	139
Severe chronic malnutrition (HFA<-3 z score)	4.0 (CI: 2.5 – 6.3)	19	2.8 (CI: 1.5 - 5.0)	12	3.4 (2.4 – 4.9)	31

The prevalence of chronic malnutrition defined as height for age <-2 Z score was 15.4% (CI: 13.1 – 18.0) and severe chronic malnutrition, defined as height for age <-3 Z score, was 3.4% (CI: 2.4 – 4.9)

Appendix 6: Prevalence of underweight based on weight for age Z-score

	<i>Males (n=469)</i>		<i>Females (n=455)</i>		<i>Total (N=924)</i>	
	%	No	%	No	%	No
Total Underweight Malnutrition (W/A<-2 z score)	27.8 (CI: 23.9 -32.2)	132	24.2 (CI: 20.3 - 28.6)	104	26.1 (CI: 23.3 - 29.2)	236
Severe Underweight Malnutrition (W/A<-3 z score)	8.0 (CI: 5.8 - 10.9)	38	5.8 (CI: 3.9 - 8.6)	25	7.0 (CI: 5.4 - 8.9))	63

The prevalence of underweight malnutrition defined as weight for age <-2 Z score was 26.1% (CI: 23.3 - 29.2) while the prevalence of severe underweight malnutrition, defined as weight for age <-3 Z score, was 7.0% (CI: 5.4 – 8.9).

Appendix 7: Child Referral Form

REFERRAL FORM FOR MALNOURISHED CHILDREN

Name of the village: _____ Date: _____

Name of the child: _____ Sex of child: _____

Age of child: _____ Name of caretaker: _____

Child diagnosed with (state the condition): _____

Child referred to: _____

Child referred by: _____

.....

REFERRAL FORM FOR MALNOURISHED CHILDREN

Name of the village: _____ Date: _____

Name of the child: _____ Sex of child: _____

Age of child: _____ Name of caretaker: _____

Child diagnosed with (state the condition): _____

Child referred to: _____

Child referred by: _____

8.0 ASSESSMENT TEAM

Overall support and co-ordination was undertaken by three FSAU Nutritionists (Ahono Busili, Tom Oguta and Peter Kingori). Tom Oguta also analyzed the data, compiled the report, incorporating comments from partners on the first draft.

Hersi Mohamud, the National VAM officer of the WFP; with assistance from Abdirizak Mohamed Nur, Mohamed M Hassan and Osman Warsame (FSAU) coordinated the assessment in Afmadow; identified and trained the enumerators and supervisors. Abdirizak Mohamed Nur, a food security analyst also analyzed and compiled the qualitative data. Thomas Kibet (World Concern) provided background information.

Six supervisors and twelve enumerators were seconded from World Concern/AFREC and local agencies based in Afmadow.

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